Cystic neoplasms of the pancreas – a descriptive study

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A Dissertation submitted in partial fulfillment

of

M.S. (General Surgery) Examination of the

Tamil Nadu

Dr. M.G.R. UNIVERSITY, CHENNAI

to be held in 2009.

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Certificate

This is to certify that the dissertation entitled *'Cystic neoplasms of the pancreas – a descriptive study'* is the bonafide original work of Dr. Mohan Mathew John towards the M.S. Branch-1 (General Surgery) Degree Examination of the Tamil Nadu Dr. M.G.R University, Chennai to be conducted in 2009.

Signature:

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I am grateful to **my parents** for their moral support and encouragement throughout my studies.

Objective

To review our experience with cystic neoplasms of the pancreas at the Christian Medical College and hospital, Vellore during the period January 2001 to November 2008.

Review of literature

Introduction

Ductal adenocarcinoma is the most common tumor of the pancreas. There are other distinctive neoplasms of the pancreas, which display a wide range of symptoms, biological behavior, and outcomes. These include endocrine neoplasms, cystic tumors, solid pseudopapillary tumors, acinar cell carcinoma, squamous cell carcinoma, pancreatic lymphoma, and metastatic lesions of the pancreas. These tumors are becoming more frequently recognized and documented in literature, and at earlier stages, due to the increased sensitivity and utilization of non-invasive diagnostic imaging. The correct identification and treatment of these neoplasms of the pancreas is becoming increasingly important.

Pancreatic cystic neoplasms are composed of a variety of neoplasms with a range of malignant potential. The classification of these tumors has become clear only in the past few years [1]. Since first identified by Becourt in 1830, the major unsolved issue has been arriving at definite preoperative diagnosis [1]. When a cystic lesion of the pancreas is detected, the most important distinction to be made is between a cystic neoplasm and a pancreatic pseudocyst. Fifteen percent of pancreatic cysts are neoplastic; malignant, or benign. Distinguishing between a cystic neoplasm and a pseudocyst is important to avoid mismanagement of a cystic neoplasm [2]. With proper surgical treatment, cystic neoplasms are one of the few curable tumors of the pancreas.

Classification

Pseudocysts make up the majority of all cystic lesions of the pancreas, the remainder comprising cystic tumors and true cysts (true cysts accounting for a very small percentage of these lesions).

Pancreatic cysts can be classified based on the presence and type of cyst lining at the microscopic level [3]:

Pseudocysts (no lining)

- Conventional pseudocysts
- Paraduodenal wall cyst (cystic dystrophy)
- Infection-related pseudocysts

Cysts with mucinous epithelium

- Intraductal papillary mucinous neoplasms and intraductal oncocytic papillary neoplasms
- Mucinous cystic neoplasms
- ‘Mucinous non-neoplastic cysts’, ‘mucoceles’ and ‘retention cysts’

Serous (clear-cell) cystic tumors

- Serous cystadenoma
- VHL-associated pancreatic cysts
- Serous cystadenocarcinomas

Squamous-lined cysts

- Lymphoepithelial cysts
- Epidermoid cysts within intrapancreatic accessory spleen
- Dermoid cysts
- Squamoid cyst of pancreatic ducts

Cysts lined by acinar cells

- Acinar cell cystadenocarcinomas
- Acinar cell cystadenomas (cystic acinar transformation)

Endothelial-lined cysts

- Lymphangiomas

Degenerative or necrotic changes in solid tumors

- Solid-pseudopapillary tumor
- Cystic change in ordinary ductal adenocarcinoma
- Cystic pancreatic endocrine neoplasia (islet cell tumors)
- Cystic change in other invasive carcinomas
- Cystic mesenchymal neoplasms

Other rare cystic lesions

- Cystic hamartomas
- ‘Enterogenous’ (congenital; duplication) cysts and duodenal diverticula
- Endometriotic cyst
- Secondary tumors
- Congenital or developmental cysts
- Others
- Unclassified cysts

The World Health Organization classified cystic neoplasms of the pancreas in 1996:
[4]

Serous microcystic adenoma (SCA)

Serous oligocystic adenoma

Serous cystadenocarcinomas

Mucinous cystadenoma (MCN)

Mucinous cystic neoplasm - borderline

Mucinous cystadenocarcinomas

- Non-invasive
- Invasive

Intraductal papillary mucinous neoplasm (IPMN)

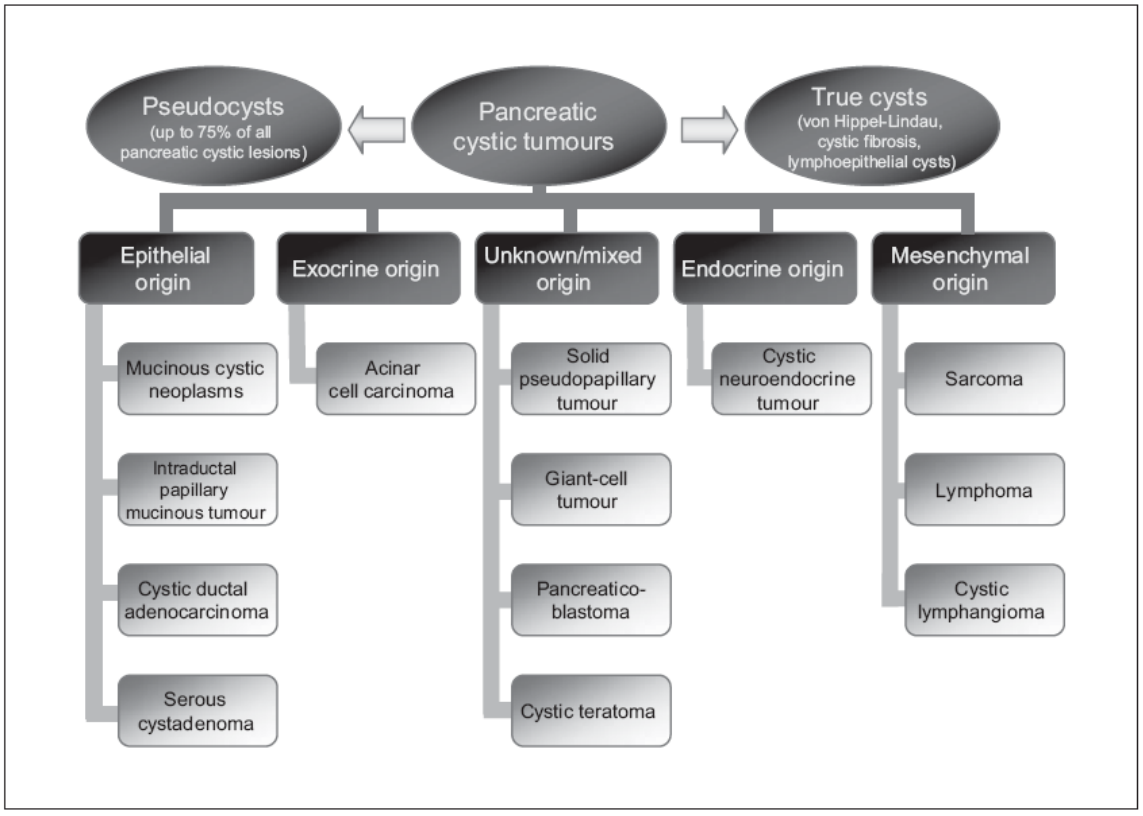
Intraductal papillary mucinous adenoma

Intraductal papillary mucinous neoplasm - borderline

Intraductal papillary mucinous carcinoma

- Non-invasive
- Invasive

Solid pseudopapillary tumors (SPT)



Cystic neoplasms of the pancreas, classified according to origin

Incidence

Cystic tumors constitute 10% of cystic lesions of the pancreas, showing all stages of cellular differentiation from benign to highly malignant tumors. Benign (serous and mucinous) cystadenomas and cystadenocarcinomas constitute 75% of these cystic tumors. These cystic neoplasms account for 1-10% of all pancreatic malignancies [5]. The incidence of radiologically detected pancreatic cystic neoplasms in screening varied from 0.2% when ultrasonography was used to 0.7% in a study using CT and MRI scans [6].

Serous cystic neoplasms predominantly affect women (65%), with an average age of 62 years (range 35-84 years) [7]. They account for 32-39% of cystic tumors of the pancreas [8]. Mucinous cystic neoplasms also affect predominantly women (>95%), with an average age of 53 years (range 19-82 years) [9]. They constitute 10-45% of cystic pancreatic neoplasms. Together with the above two, intraductal papillary mucinous neoplasms of the pancreas (IPMNs) accounting for 21-33%, comprise the three most commonly encountered tumors [8]. IPMNs occur a little more commonly in males at an average age of 65 years. Solid papillary epithelial neoplasia (SPENs) are tumors that predominantly occur in females in the third to fourth decade of life [8]. Non-functioning islet cell tumors (NFITs) with cystic degeneration occur at an average age of 53 years. Acinar cell cystadenocarcinoma most commonly occurs in males and constitutes <1% of cystic tumors [8].

Clinical features

Up to 40-75% of patients with cystic pancreatic tumors are asymptomatic, with the majority being detected incidentally on imaging modalities [10]. When the lesion is symptomatic, the patient may present with recurrent pancreatitis, chronic abdominal pain, or jaundice. Symptoms are a result of pressure effects and are more common in mucinous lesions - the incidence of symptoms correlating with the risk of malignancy [11]. The most commonly encountered symptoms are abdominal pain, weight loss and nausea [12]. The less common symptoms are constipation, diarrhea, abdominal distension, fatigue, early satiety and, in the rare event of functioning tumors, the patient may show signs of hypoglycemia [13]. Jaundice, as a symptom, is uncommon in serous neoplasms even if the lesion is of a large size. In contrast, it is seen in 25-54% patients with mucinous tumors in the head of the gland [9]. A patient presenting with a large lesion in the head and neck of the pancreas without jaundice, should arouse the suspicion of a cystic neoplasm. A prior history of pancreatitis is generally confirmatory of pseudocysts, although the occasional cystic neoplasm may give rise to an attack of pancreatitis following partial duct obstruction. Bleeding-related complications secondary to gastric involvement, portal hypertension, hemobilia or hemosuccus pancreaticus, can be seen in malignant mucinous neoplasms [14]. IPMNs, when symptomatic, present with signs of chronic pancreatitis and pancreatic insufficiency, i.e. pain, steatorrhea, weight loss or diabetes. They can also present as acute or recurrent pancreatitis. Diabetes is found to be associated with mucinous tumors, especially those that are malignant [15]. Rare

associations with Peutz-Jeghers and Zollinger Ellison syndrome have been described. On examination, a palpable mass may be detected in cases of malignant mucinous cystic lesions [14].

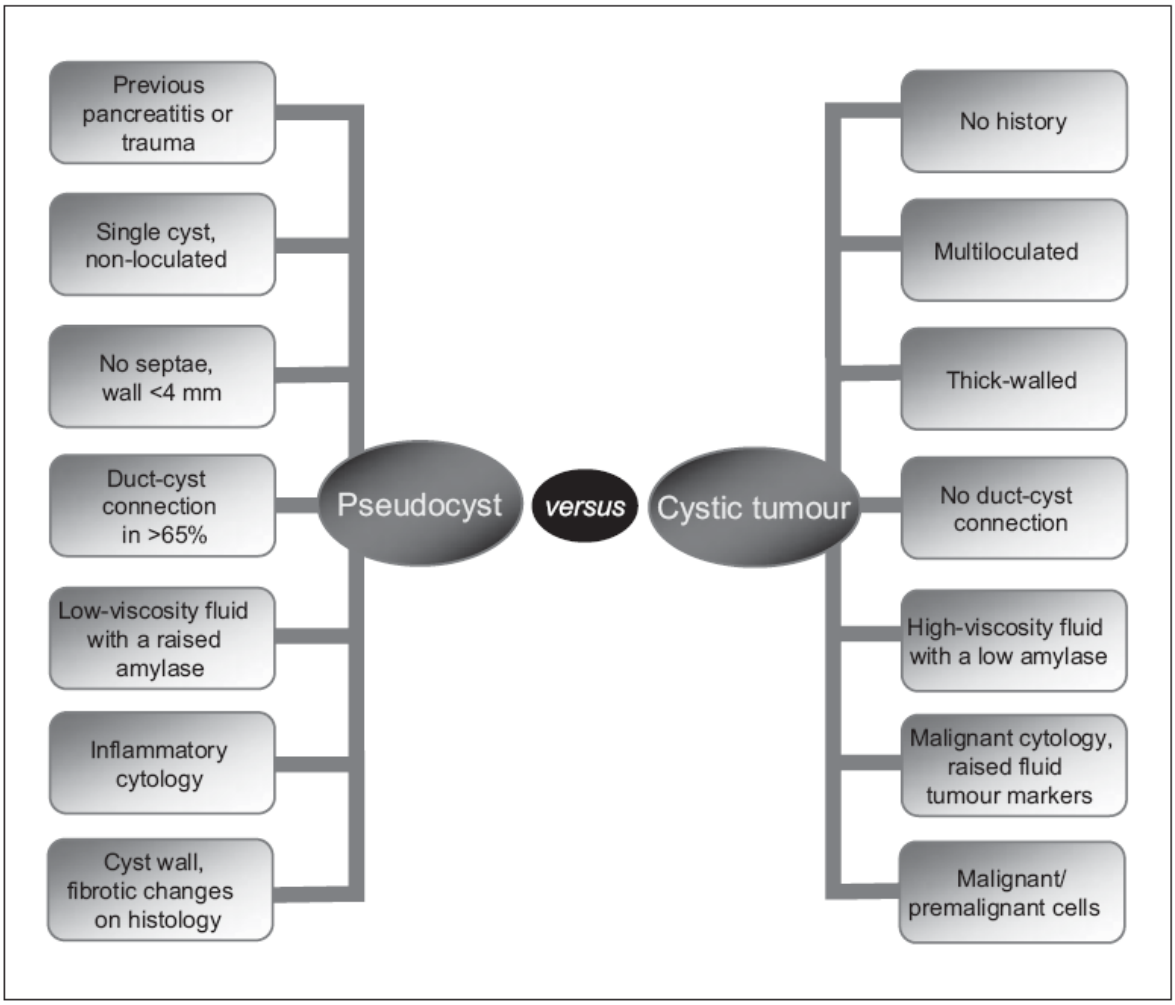
Pancreatic pseudocysts

Pancreatic pseudocysts comprise >70% of all cystic lesions within the pancreas. Pancreatic pseudocysts are collections arising from around the pancreas, which lack an epithelial lining, and they occur following acute pancreatitis, chronic pancreatitis or secondary to pancreatic trauma. Pseudocysts normally contain necrotic fat and a mixture of necrotic cells, including neutrophils surrounded by granulation tissue, which eventually matures to form a fibrotic pseudocapsule. Pseudocysts can present in various ways ranging from abdominal pain, gastric outlet obstruction, obstructive jaundice, nausea or sepsis secondary to infection. Hemorrhage complicates only 5% of the pancreatic pseudocysts but carries with it a mortality of 40%. The cause of bleeding is due to pressure erosion of nearby blood vessels by the pseudocyst; the arteries usually affected are the splenic, gastroduodenal and superior pancreaticoduodenal arteries. The diagnosis of a pseudocyst is usually straightforward, with a clear history of either acute or chronic abdominal pain, or associated abdominal trauma. While pseudocysts have no malignant potential, many cystic neoplasms of pancreatic origin may mimic pseudocysts. Case reports of cystadenomas, papillary cystic tumors and giant cell tumors of the pancreas all misdiagnosed as pseudocysts are described in literature [16-18]. For this reason, proper sampling of pseudocysts is essential

and should consist of the cyst wall biopsy during open procedures or cyst contents during minimal access drainage procedures. Up to 65% of the pseudocysts will have communication with the pancreatic ducts. Aspirated pseudocyst content will appear ‘prune juice’ in colour macroscopically (due to altered blood and pancreatic juice) typically with a high amylase, low viscosity and cytology consistent with an inflammatory origin. Pancreatic pseudocysts arising after acute pancreatitis can often be managed conservatively, whereas the thicker-walled pseudocysts arising as a feature of chronic pancreatitis frequently require drainage.

Pseudocysts which have not regressed or have increased in size may require surgical drainage and a variety of different methods have been described including open/laparoscopic pancreaticocystgastrostomy or pancreaticocystjejunostomy, percutaneous aspiration and drainage or endoscopic transmural or transpapillary drainage. Pseudocysts > 10 cm in size (associated with an increased risk of complications such as bleeding and infection), cysts persisting for > 6 weeks and symptomatic cysts are indications for drainage [19]. In recent years, open drainage of pancreatic pseudocysts has been replaced by laparoscopic and endoscopic techniques. A recent systematic review of 19 reported cohort series of laparoscopic drainage and 25 cohort series of endoscopic drainage of pseudocysts revealed no significant differences in success rates, complication rates, mortality rates or re-intervention (98.3 vs. 80.8%, 4.2 vs. 12%, 0 vs. 0.4%, 0.8 vs. 0.2% respectively) [20]. However, the

size of pseudocysts drained laparoscopically was significantly greater (12 vs. 7 cm) and the recurrence rate significantly higher for the endoscopic approach (14.4 vs. 2.5% for the laparoscopic approach).



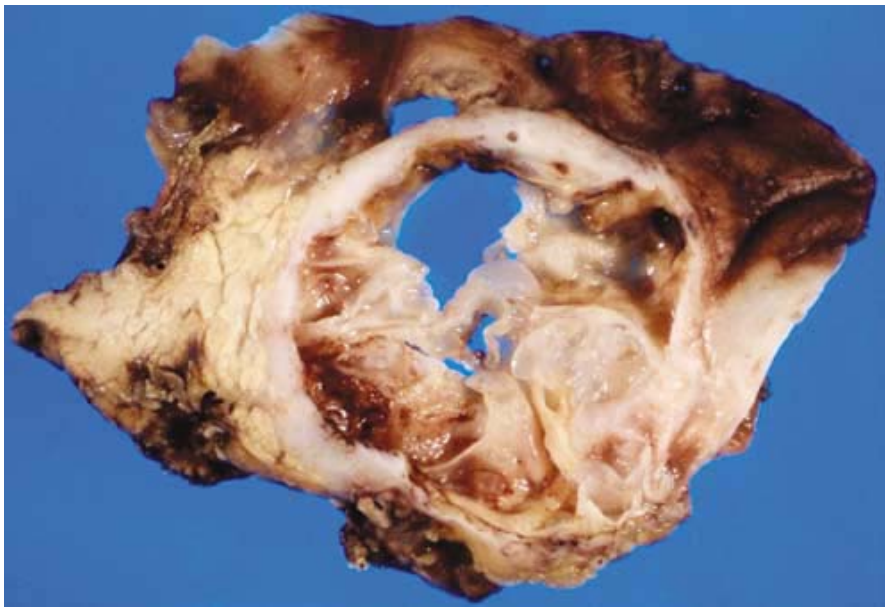
Differentiation of a pseudocyst from a cystic neoplasm of the pancreas

Pathology

Mucinous cystic neoplasms are presumably de novo cystic tumors (unlike IPMNs which give rise to cystic dilatation of native ducts), and they are characterized by an ovarian type of stroma. Macroscopically, these neoplasms are composed of large multilocular cysts ranging in size from one to several centimeters. The cysts have thick fibrotic walls. Unless there is fistula formation, the cysts do not visibly communicate with the pancreatic ductal system. The wall of the cysts may have velvety papillations, appear trabeculated, and thickened. The cyst contents are often mucoid; hemorrhagic or a more watery consistency may also be noted. Solid areas within the neoplasm should be sampled extensively for microscopic examination, as they may harbor an invasive component.

Mucinous cystic neoplasms of the pancreas are morphologically similar to mucinous cystic neoplasms that occur in the retroperitoneum, ovary, and liver. This resemblance includes the presence of a distinctive stroma (referred to as ovarian-like) around the cysts which is a very common and an entity-defining feature of these neoplasms. There are two hypotheses on the origin of a neoplasm in the pancreas with ovarian-type stroma. The first hypothesis is that these neoplasms arise from rests of embryologic ovarian tissue deposited in the pancreas. This hypothesis is supported by the close proximity of the left ovarian primordium to the tail of the pancreatic anlage in fetal life. The second hypothesis is that the stroma represents a recapitulation of periductal fetal mesenchyme, the

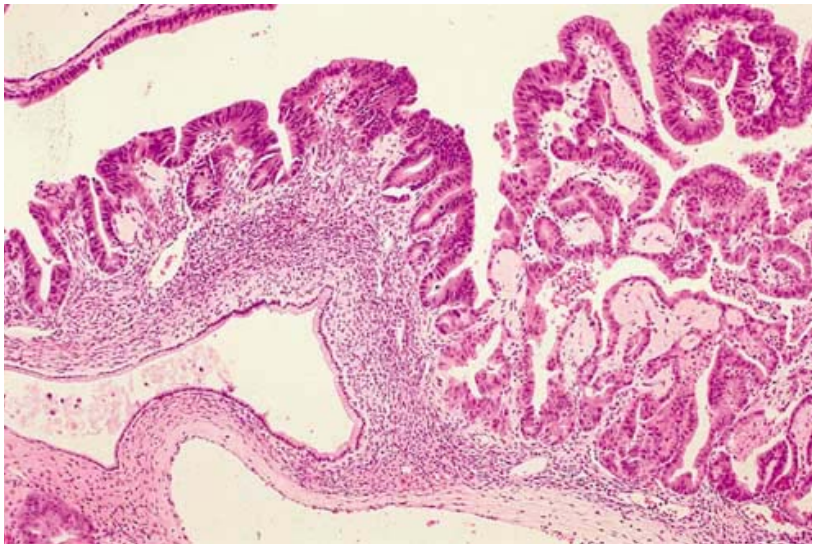
primitive mesenchyme seen around the pancreatic and hepatic ducts in the developing fetus [21]. Regardless of its origin, it is clear that this stroma is hormone sensitive; it is often admixed with luteal-type cells and it regularly expresses progesterone receptors.



Mucinous cystic neoplasm, gross appearance

The cysts in mucinous cystic neoplasms are lined by tall, columnar, mucin-producing epithelium, which may exhibit gastric foveolar-type intracellular mucin or goblet cells. Scattered neuroendocrine cells are present in the majority of cases and they can be demonstrated by immunohistochemical labeling for neuroendocrine markers such as chromogranin and synaptophysin. The epithelium in the predominantly cystic and adenoma components of MCNs are virtually indistinguishable from those of IPMNs. The papillary components, however, show some differences. MCN papillae do not typically have the full-blown villous adenoma-like appearance and diffuse MUC2/CDX2 expression

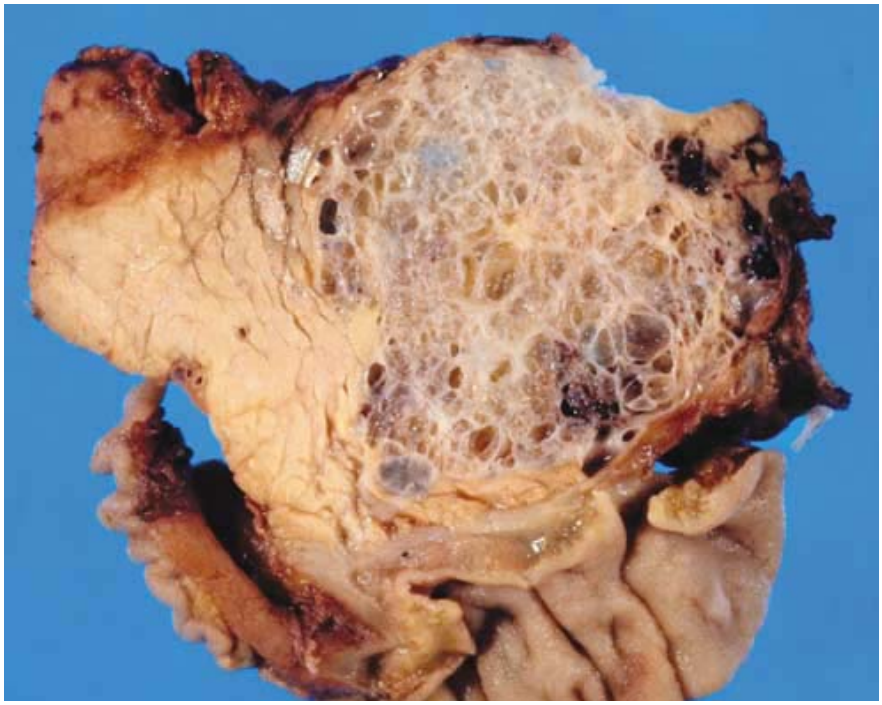
characteristic of the ‘intestinal’ (darkcell, columnar-cell) subset of IPMNs. Instead, they often show MUC1 expression similar to the pancreatobiliary subtype of IPMNs. Some mucinous cystic neoplasms have purulent contents and these may be misdiagnosed as pseudocysts both intraoperatively as well as histopathologically especially if the epithelium is denuded, and the remaining ovarian stroma resembles the granulation tissue of pseudocysts. Inflammation may also impart a more complex architecture to an otherwise simple mucinous cystic neoplasm and raise the suspicion of malignancy. Mucinous cystic neoplasms can show a wide range of cytologic and architectural atypia. Some are histologically bland, with uniform, basally oriented nuclei, and minimal architectural atypia, while others exhibit prominent papillary proliferations that form intraluminal polypoid masses with cribriform architecture and substantial cytologic atypia.



Mucinous cystic neoplasm, microscopic appearance

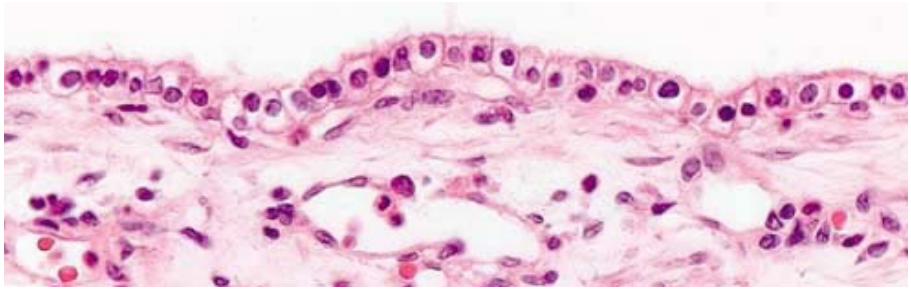
Patients with completely resected mucinous cystic neoplasms without atypia (mucinous cystadenomas) are almost always cured. Mucinous cystic neoplasms with moderate atypia are classified as mucinous cystic neoplasms with moderate dysplasia, while those with significant architectural and cytologic atypia are classified as mucinous cystic neoplasm with carcinoma in situ. Patients with these latter two grades of noninvasive mucinous cystic neoplasms are also often cured if their tumors are resected completely. If an invasive carcinoma is present, the neoplasm should be classified as a mucinous cystadenocarcinoma. The invasive carcinomas that arise in association with mucinous cystic neoplasms are usually tubular/ductal type. Interestingly, these have been found to pursue a more indolent course than ductal adenocarcinoma.

Serous cystadenoma is a benign neoplasm composed of uniform cuboidal glycogen-rich epithelial cells that form small cysts containing serous fluid. Serous cystadenomas are the prototypical and almost sole example of microcystic pancreatic neoplasms. In fact, the gross appearance of most serous cystadenomas—numerous, tightly packed small cysts and a stellate scar, creating a sponge-like appearance—is diagnostic of the entity. Serous cystadenomas usually present as relatively large masses measuring up to 25 cm, mostly in the body or tail of the pancreas.



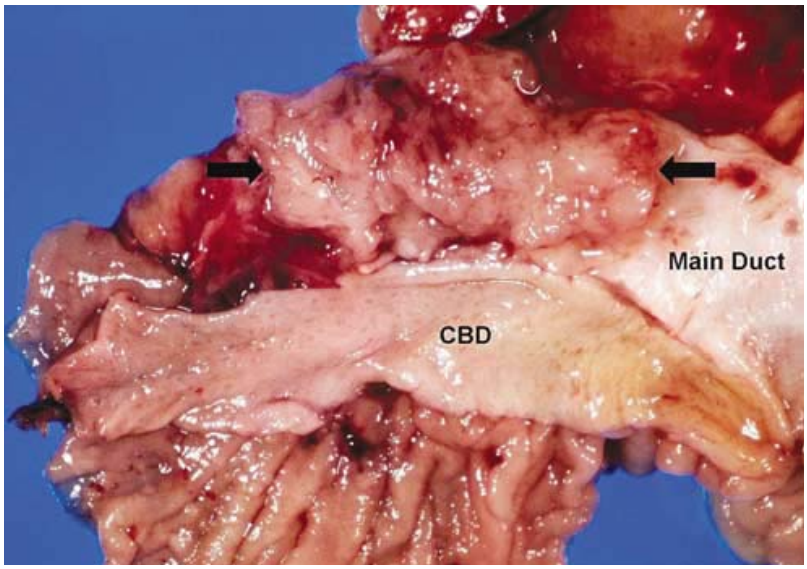
Serous cystadenoma, macroscopic appearance

Microscopically, these neoplasms have distinctive morphologic features. The cells lining the small cysts have clear cytoplasm, well-defined cytoplasmic borders, and small, round uniform nuclei with dense, homogeneous chromatin. Serous cystadenomas are presumed to arise from the centroacinar cell-intercalated duct system. They are negative for mucin stains, and the glycogen can be highlighted by the PAS stain.



Histopathology of serous cystadenoma

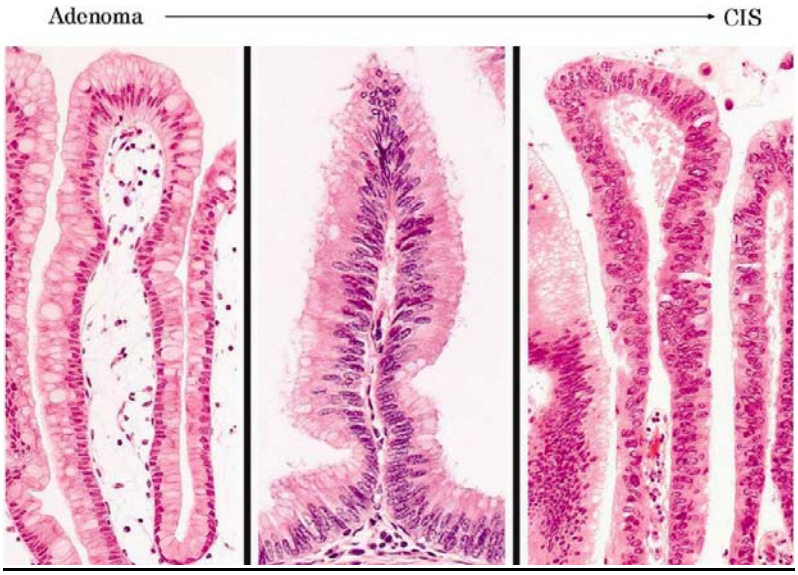
Intraductal Papillary Mucinous Neoplasms (IPMNs) are characterized by cystic dilatation of pancreatic ducts in which an intraductal proliferation of neoplastic mucin-producing cells is usually arranged in papillary patterns. The papillae may range from microscopic to large nodular masses. Mucin production by the neoplastic cells is usually associated with intraluminal mucin secretion which leads to cystic dilatation of the ducts, and at times, to mucin extrusion from the ampulla of Vater, a finding that is virtually diagnostic of IPMN. Depending upon the location of the primary process and subsequent mechanical changes in the ducts, IPMNs may present as a spectrum of multilocular cystic masses, villous/papillary nodules or with mucin extrusion from the ampulla. Macroscopic examination of IPMNs is imperative for documenting involvement of the pancreatic ductal system and the distribution of the disease within the ductal system, especially since there are no basal or myoepithelial cells in pancreatic ducts to distinguish native ducts. In some cases, the IPMN primarily involves the main pancreatic duct, and in others the branch ducts. The latter have been referred to as ‘branch-duct’-type IPMNs. Some authors believe this variant is a biologically distinct entity, and therefore every attempt should be made during macroscopic examination to determine the distribution of the lesion. IPMNs may be localized, multicentric or, rarely, the entire ductal system may be involved.



Intraductal Papillary Mucinous Neoplasm, macroscopic appearance

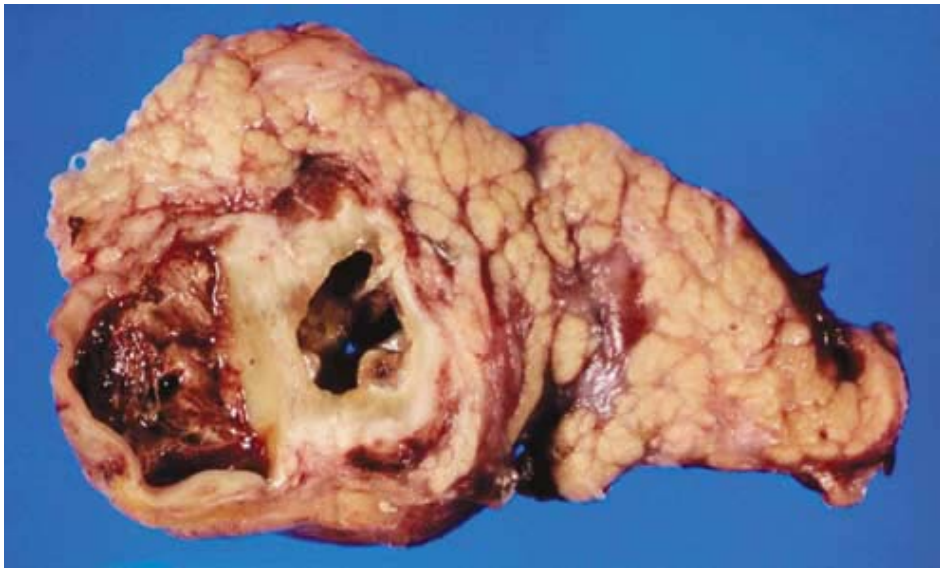
Microscopically, the cystically dilated ducts of IPMNs contain mucin-producing cells with various degrees of atypia. Papillae with three distinct morphologic patterns may be seen (1) intestinal, which is morphologically similar to that of colonic villous adenomas of the colon (2) pancreatobiliary, in which the papillae are more complex and are lined by cuboidal cells with prominent nucleoli and (3) gastric, rarely some papillas have gastric foveolar appearance. As this phenotype is also common in the nonpapillary areas of these tumors, it is also referred to as 'null' type [22]. As advocated by the World Health Organization classification, noninvasive IPMNs are graded as adenoma, borderline-tumor and in situ carcinoma. Invasive adenocarcinoma, which is seen in less than 30% of cases is usually either of the colloid or tubular types. The former has been found to have indolent behavior, analogous to the colloid carcinomas of the breast, regardless

of whether it is associated with IPMN or not.



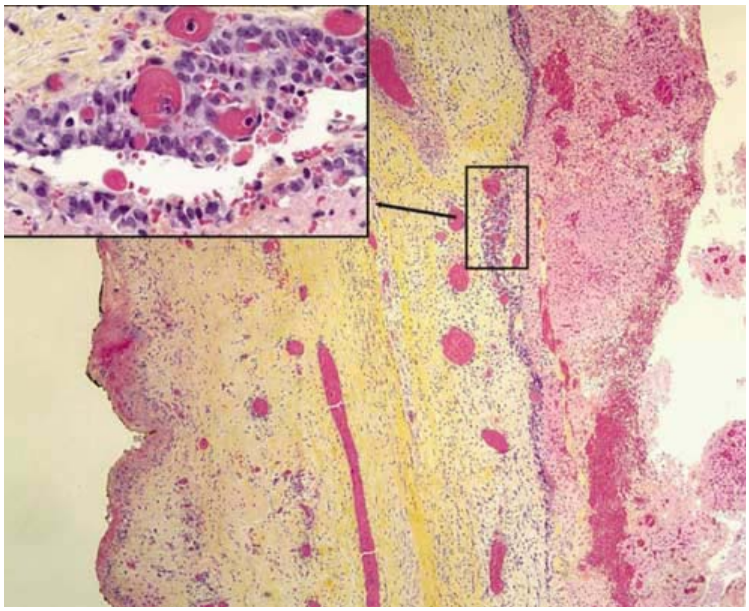
IPMN, histopathology

Solid Pseudopapillary Tumor (SPT) is the most recent name advocated by the WHO for a distinctive tumor type in the pancreas that often presents as a cystic mass. For this reason it was previously (and is sometimes still) referred to as 'solid and cystic', 'solid and papillary', 'cystic and papillary' and 'papillary cystic'. It is now known that the cavities that form in SPTs are not 'true' cysts (there is no epithelial lining) but rather represent a necrotic/ degenerative process. The cystic areas often contain blood, necrotic debris, and clusters of foamy macrophages. In the cavity wall, characteristic morphologic features of these neoplasms include pseudopapillary architecture, hyaline globules, clusters of uniform cells mimicking neuroendocrine neoplasia, and grooved nuclei.



Gross pathology specimen of solid pseudopapillary neoplasm

SPT is practically unique to the pancreas, with no close kindred in any other organ. It does not show clear-cut pathogenetic relationship to any of the cells normally found in the pancreas; there is no evidence for ductal, acinar, or frank endocrine differentiation. Immunohistochemically, the neoplastic cells express nonspecific markers such as vimentin, CD56, alpha-1-antitrypsin and neuron-specific ('non-specific') enolase; epithelial markers (keratins) can be focal or weak. Synaptophysin and NSE are commonly positive in SPTs; however chromogranin, the most specific endocrine marker, is typically negative. C-kit (CD117) expression has also been detected in a substantial portion of SPTs. The neoplastic cells consistently express progesterone receptors and also the beta form of estrogen receptors, suggesting a role for hormones in the evolution of these neoplasms.



Microscopic appearance of solid pseudopapillary neoplasm

Imaging

Ultrasound and Computerised Tomography

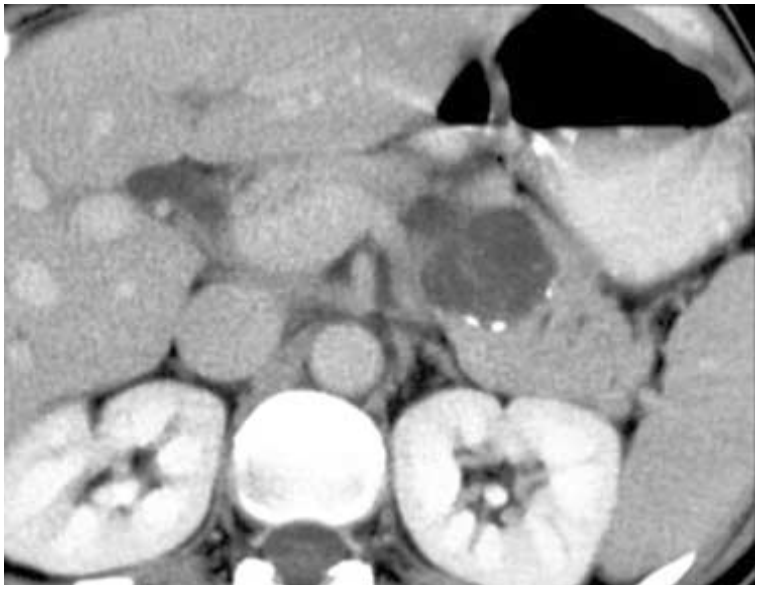
Ultrasonography is a useful basic investigation as it can help differentiate a solid from a cystic lesion but it does not permit a complete characterization due to the presence of bowel gas that often obscures vision.

CT scan is the most favored initial diagnostic test for cystic tumors of the pancreas. It is not only useful in the diagnosis but also helps in characterization of the lesion based on calcification of the cyst wall, septa, mural nodules and the findings suggestive of pancreatitis [23]. Enhanced CT with bolus injection of contrast medium and thin collimation is useful in differentiating SCA from mucinous cystic neoplasms (MCNs).

Appearances

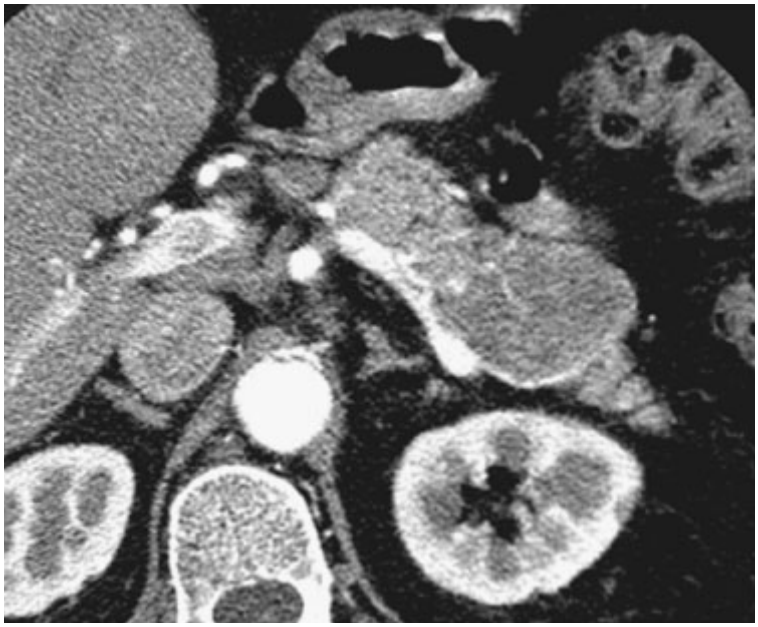
MCA - near water density unilocular or multilocular large cysts with enhancing walls and septa, and peripheral calcifications.

Mucinous cystadenocarcinomas (MCACs) – thick walled (<2 mm) macrocysts, with septations, a solid component and a peripheral rim of calcifications.



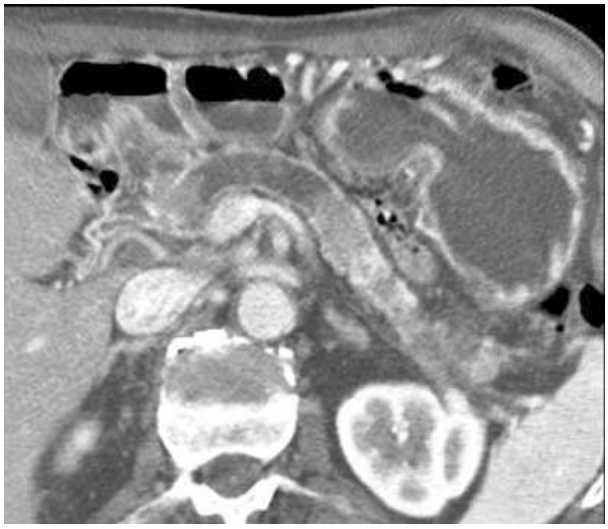
Mucinous cystadenoma shows a well-defined cyst in the body of the pancreas with internal septations and few macrocysts

SCA - water, soft tissue or mixed density; poorly defined to thin, well defined capsule; multiple, small (<2 cm) well-defined cysts, central calcifications, and enhancement around microcysts after contrast administration.



Well-defined mass in the distal body of the pancreas with fine surface lobulations and a honeycomb pattern due to the presence of numerous microcysts, suggestive of serous cystadenoma

IPMN - segmental or diffuse dilatation of the pancreatic ductal system. In side-branch IPMN, involvement is limited to segmental ducts, resulting in a solitary cystic mass with an otherwise normal ductal system.



Markedly dilated main pancreatic duct with pancreatic parenchymal atrophy - main duct IPMN

SPT - hypervascular peripheral solid components and central cystic. Atypical SCAs may appear as solid masses due to innumerable tiny cysts below the resolution of imaging equipment, or they may contain larger cysts similar to those of MCN. In this respect, some malignant cystic lesions mimic the appearance of a pseudocyst or other benign lesions.

Peripheral calcification and enhancing nodules are seen along with cystic or necrotic areas – consistent with solid pseudopapillary tumor

Magnetic Resonance Cholangio Pancreaticography

MRI provides better characterization of the morphology of the cyst. In the case of IPMN it is being strongly advocated as the diagnostic modality of choice. Its advantage over ERCP stems from its ability to image the pancreatic duct anatomy/configuration and size, as filling of the side branch ducts may be obscured by intraductal mucin plugs in ERCP. Taouli et al [24] have shown that certain features of IPMN detected on MRI may actually indicate a higher probability of a malignancy, i.e. presence of a solid mass, main pancreatic duct

dilatation (<10 mm), diffuse or multifocal involvement, and attenuating or calcified intraluminal content.

Endoscopic Retrograde Cholangio Pancreaticography (ERCP)

ERCP plays a role in identifying the ductal anatomy and delineating the presence of any communication between the cyst and the duct that may be present in up to 65% cases [25]. The main indication was the diagnosis of IPMN based on the demonstration of the communication of the tumor with the main duct and the side branches, as well as discharge of mucin from the ampulla. It is still an important investigation in the exceptional case of a patient with a cystic mass in the head of the pancreas very close to the main duct of Wirsung and where a differentiation between IPMN and even a serous cyst adenocarcinoma appears difficult and necessitates the demonstration of the relationship between the mass and the duct.

Angiography

The vascularity of the tumor and the peripancreatic region can be studied with the help of angiography that can help to differentiate a hypervascular tumor from hypovascular pseudocysts. We must remember that cystic tumors may also be hypovascular simulating pseudocysts. With the availability of better non-invasive diagnostic tests, the need for angiography has reduced.

Endoscopic Ultra Sonography (EUS)

The main role for EUS in cystic pancreatic neoplasms is to provide detailed morphology of the cystic lesion (including the presence of intramural nodules in IPMN) and to guide fine-needle aspiration cytology (FNAC) of the lesion. It has its limitations in differentiating mucinous from non-mucinous cystic lesions due to its low sensitivity and specificity, i.e. 38.9% and 75.0%, respectively [12]. This also causes difficulty in differentiating benign from malignant lesions.

Cyst fluid analysis

The analysis of the cyst fluid obtained from EUS-guided aspiration provides valuable information if analyzed for biochemistry, tumor markers and not only cells as these aspirates tend to be paucicellular. In general, glycogen-rich cells are specific for serous cystadenoma, mucin-containing cells are seen in mucinous cystadenomas, and malignant cells are seen in mucinous cystadenocarcinomas [26]. Potential complications of FNA include spillage of malignant cells into the peritoneum, hemorrhage and injury to adjacent organs. The table below shows the various components that are analyzed and the quantities in which they are found in the various common neoplasia

Component	SCA	MCN	IPMN	Pseudocyst
Amylase	Low	Low	High	High
CEA	<5	>800	5-800	<5
CA 19-9	<37	Variable	Variable	<37
CA 15-3	Low	High	Low	Low
TAG 72	<3	3-137	High	<5.7
Malignant cells	Absent	Absent	Absent	Absent
CA 125	Low	Variable	Low	Low
Viscosity	Low	High	High	Low

Positron Emission Tomography (PET) scan

Sperti et al. [27] have suggested that 18-FDG PET may be better than CT and tumor marker assays in the preoperative evaluation of patients with cystic pancreatic lesions. This is because a positive result strongly suggests malignancy, and hence warrants surgical treatment. A negative result implies a benign lesion that may be treated by limited resection or, in selected high- risk patients, with biopsy, follow-up, or both.

Management

The treatment of cystic pancreatic tumors depends on the probable diagnosis, as the likelihood of malignancy is closely related to the type of histology. The possibility of malignancy in a serous cystic tumor is as low as 3%, while main duct IPMNs have a 70% chance of being malignant [28]. Mucinous cystic tumors can be best considered as premalignant.

The need to operate on patients with lesions that are <3 cm is still controversial. While Sahani et al. [29] have found that lesions <3 cm are usually benign, Kiely et al. [13] have stressed the need for enucleation even in patients with lesions <2 cm, as long as the patient can withstand the operation. This recommendation is based on a high incidence of false negatives seen in investigations. Allen et al. [30] in a recent large series of 539 cases spanning 10 years have concluded that selected patients with cystic lesions <3 cm in diameter and without a solid component may be followed radiographically with a malignancy risk that

approximates the risk of mortality from resection. This is based on the premise that small mucinous lesions are unlikely to be malignant.

The currently accepted guidelines are that for serous cystadenomas, an organ-preserving resection should be carried out, although there are proponents of a conservative line of management. Accepted consensus is that lesions that are asymptomatic and/or <4 cm in size can be followed up at yearly intervals, while surgical treatment should be offered to patients with symptomatic lesions and tumors >4 cm, because they have been seen to grow at a rate of almost 1.98 cm/year [31].

In the case of mucinous tumors, a more radical resection is advised. This is based on the understanding of their malignant potential. As these tumors usually occur in the fifth decade, the likelihood of a malignant transformation is also high. In the presence of predictors of malignancy, such as large tumor size, mural nodules and egg-shell calcification, spleen preserving techniques should be avoided to obtain a correct oncological lymph node dissection.

In the case of IPMN, where the tendency is for the tumor to grow along the ducts rather than radially into the parenchyma, the resection margins must be examined by frozen section intraoperatively to confirm the clearance of the margins. The current recommendation is to resect all main duct and mixed variant IPMNs as long as the patient is a good surgical candidate with a

reasonable life expectancy [28]. Routine total pancreatectomy is not indicated and should be performed only for obvious extensive, but resectable, histologically confirmed disease involving the entire gland. The issue of management of pure branch-type IPMNs remains to be resolved, with conflicting data on whether a conservative approach or an anatomic resection should be performed. The IAP consensus for management of IPMNs [28] has attempted to put some of these doubts to rest by recommending surgery for symptomatic lesions. However, they have added that other indications could include patients willing for surgery and unlikelihood of follow-up. This remains an option only if a safe pancreatic resection is available.

Solid pseudopapillary tumors of the pancreas are best described as indolent and non-aggressive. However, local and distant metastases are possible. Formal resection with curative margins is essential to ensure the best possible long-term survival. An aggressive approach would also appear to be justified regardless of tumor size or metastatic spread. For lesions located at the pancreatic body and tail, segmental or distal pancreatectomy, with preservation of the spleen where possible, is recommended. In case of cystic masses that are malignant or potentially malignant in the head of the pancreas, pancreaticoduodenectomy is the preferred option, but enucleation can be performed if there is an accurate diagnosis of a benign lesion.

Tanaka et al. have described the indications for a ‘wait and see’ policy in MCNs and IPMNs which include [28]:

1. Symptomatic cysts without main duct dilatation (<6 mm)

2. Those without mural bodies

3. Those <30 mm in size

The ideal investigations for monitoring such patients would be CT or MRCP and EUS.

The suggested interval between follow-up examinations would be:

- yearly for lesions <10 mm in size

- 6-12 monthly follow-up for lesions between 10 and 20 mm

- 3-6 monthly follow-up for lesions >20 mm

The interval can be lengthened after 2 years of stationary findings. Indications for giving up the conservative management would include the appearance of symptoms, and findings contrary to those listed above.

Adjuvant treatment

A few reports exist on the use of chemotherapy, and occasionally, radiotherapy in the adjuvant setting. The indications are evidence of tissue invasiveness in the pathological specimen, liver metastasis (chemoembolization), unresectable tumor (radiotherapy), large tumors (neoadjuvant chemotherapy to downsize the tumor for surgery), and with aneuploid neoplasms [14]. Sarr et al. have suggested a role for adjuvant treatment even in the absence of lymph node metastasis [32]. The role of chemoradiation, whether in the adjuvant or

neoadjuvant setting, requires more studies to prove the efficacy. Maire et al. [33] have suggested that in the absence of current evidence for adjuvant therapy in pancreatic cancer, patients with locally advanced malignant cystic neoplasms, especially IPMNs, should be included in the same protocols assessing adjuvant chemotherapy and radiotherapy regimens as patients with ductal adenocarcinoma.

Prognosis

The overall 5-year survival nears 100% for serous cystadenoma and even mucinous cystadenoma where the resection margins are clear and there is no evidence of transmural invasion [8, 10]. Even in IPMNs containing carcinoma, 5-year survival is over 50% [34]. Solid pseudopapillary tumors have a cure rate of 80%.

Details of the study

Methods

A retrospective review of the medical records of patients who underwent operative therapy for cystic neoplasms of the pancreas at the Christian Medical College and Hospital, Vellore from January 2001 through November 2008 was conducted. Medical records were examined for presenting signs and symptoms, diagnostic modalities, laboratory values, surgical procedure, pathologic features, and postoperative complications. Data was entered into a standard proforma and analyzed.

Study design

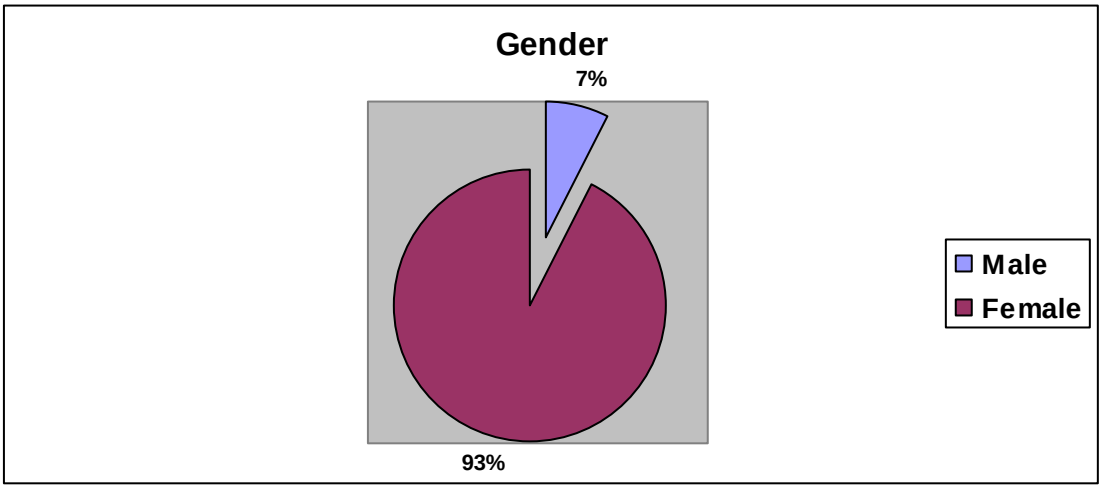
Retrospective review

Exclusion criteria

1. Pancreatic pseudocyst
2. Solid tumors of the pancreas

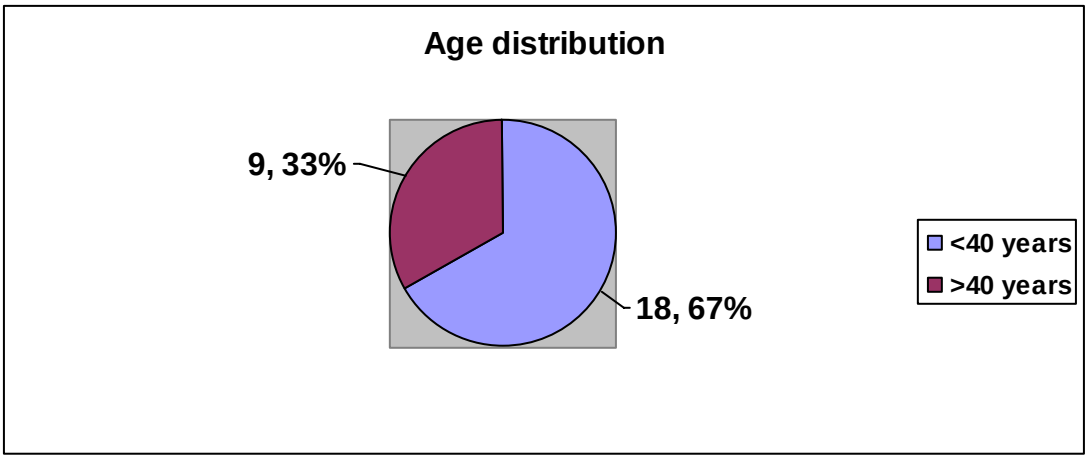
Results

A total of 27 patients were identified who underwent operative therapy for pancreatic cystic neoplasms. Most were female (93%).



Age

Patients ranged from 17 years of age to 62 years. The average age was 35 years. Two-thirds of the patients were below 40 years of age.

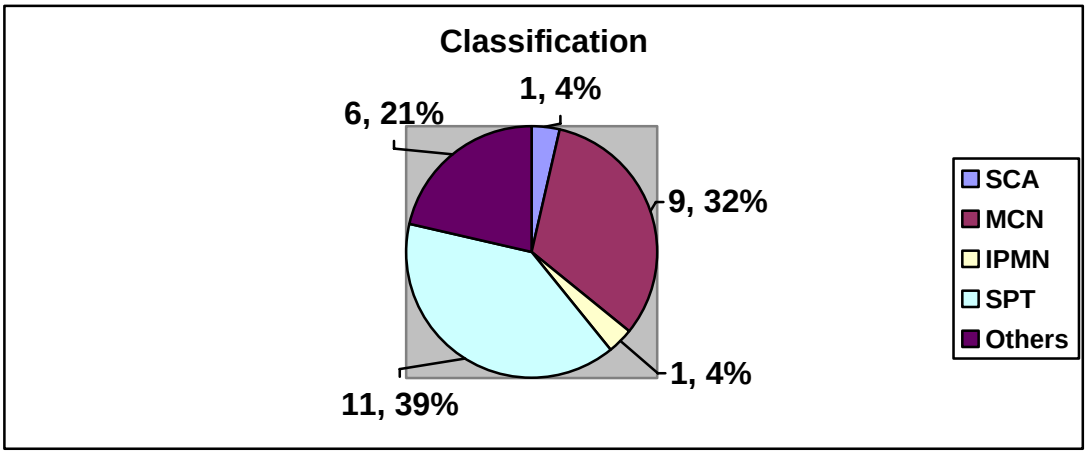


Age(yr)/Subtype	SCA	MCN	SPT	IPMN	Others
10-20	-	-	2	-	1
20-30	-	1	6	-	2
30-40	-	2	3	-	-
40-50	-	5	-	-	1
>50	1	1	-	1	1

Age-wise distribution of each sub-type of tumor

Classification

Mucinous cystadenoma and solid pseudopapillary tumor were the predominant subtypes in our series.

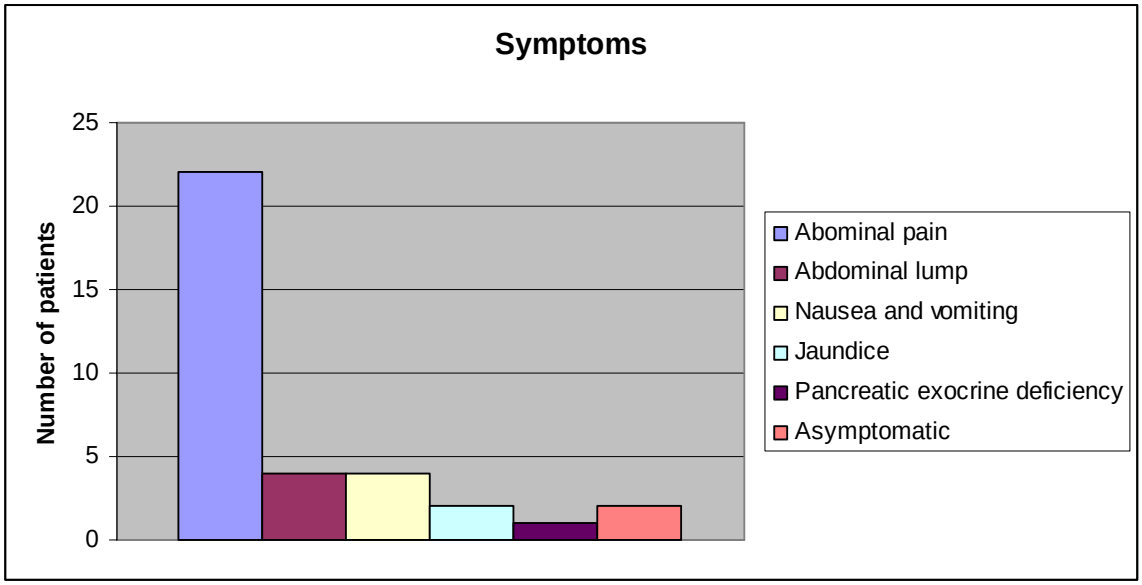


Clinical features

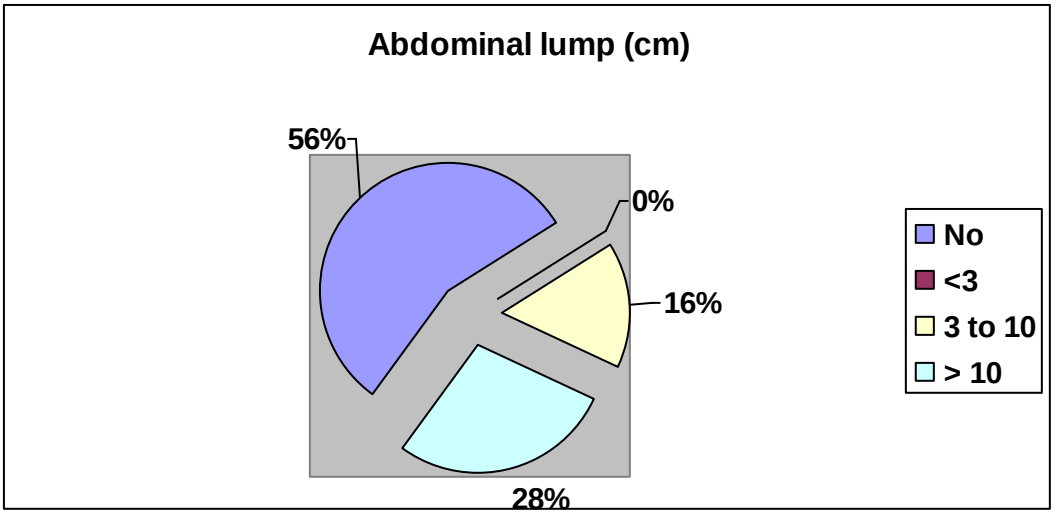
The duration of symptoms ranged from 2 months to 5 years. The average duration of symptoms was 19 months.

The neoplasm was incidentally detected on ultrasound in 8% of patients. Eighty percent of patients had abdominal pain as the presenting symptom. Abdominal lump and vomiting were seen in a minority of patients. None of the patients had a previous history of pancreatitis.

Symptom	Number of patients (%)
Abdominal pain	22 (81)
Abdominal lump	4 (15)
Nausea and vomiting	4 (15)
Jaundice	2 (7.5)
Acute abdomen	1 (3.7)
Pancreatic exocrine deficiency	1 (3.7)
Asymptomatic	2 (7.5)



In about half the patients an abdominal lump was palpable. Two patients had splenomegaly.



Investigations

Hemoglobin: 5 out of 27 (18%) patients had a hemoglobin value of < 10g%.

Blood sugar: 2 patients (7.5%) were found to be diabetic at the time of presentation.

Liver function tests in most patients were normal, except for elevated serum alkaline phosphatase levels in 7 (26%) patients.

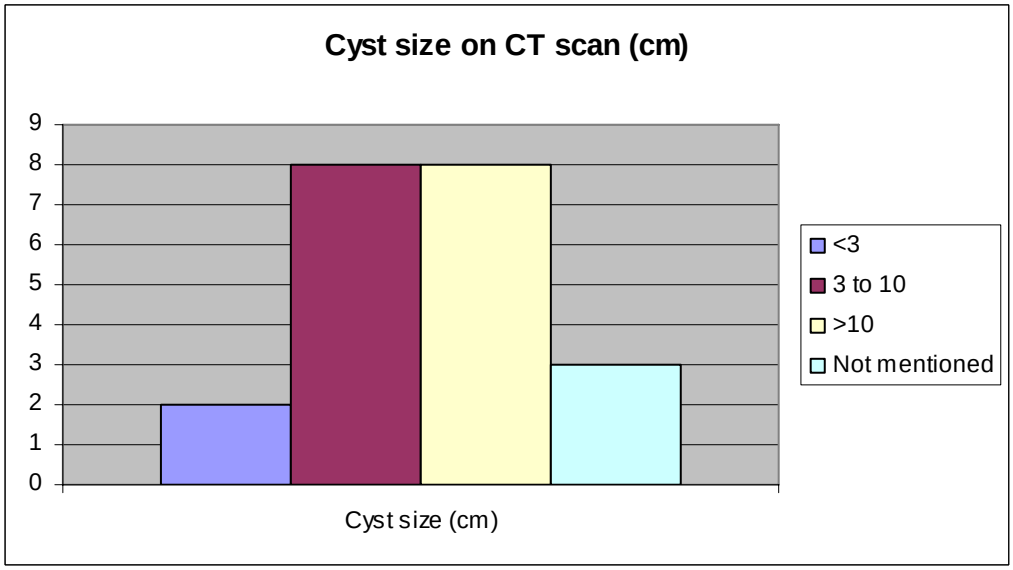
Serum amylase was only mildly elevated in 23% of patients (up to 497 U/L).

Serum lipase levels were elevated, though not significantly, in 4 out of 8 patients in whom the investigation was done.

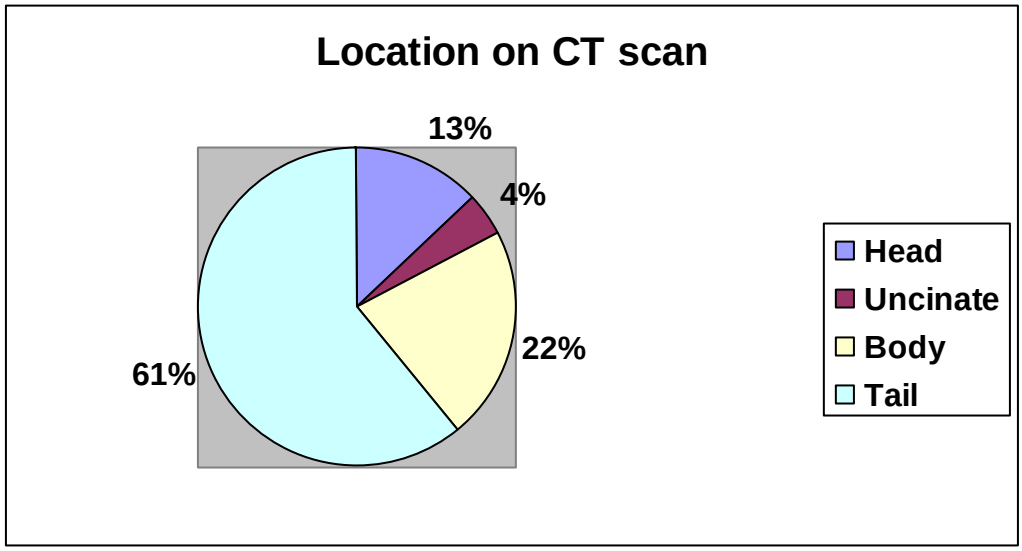
Tumor markers: CA 19 – 9 was done in 13 patients. 3 patients had an abnormally high value, but all values were less than 1000. CEA was done only in 7 patients, with only 1 elevated value. CA-125 was done in one patient suspected pre-operatively to have an adnexal tumor.

Imaging

Ultrasound was done in 6 (22%) patients. It was useful in differentiating a cystic neoplasm from a pseudocyst. CT scan of the abdomen was done in 23 out of 27 patients. The cyst size on CT scan was less than 3 cm in only 2 patients (8%).



Location of cyst: Almost two-thirds of the lesions were found in the tail of pancreas.

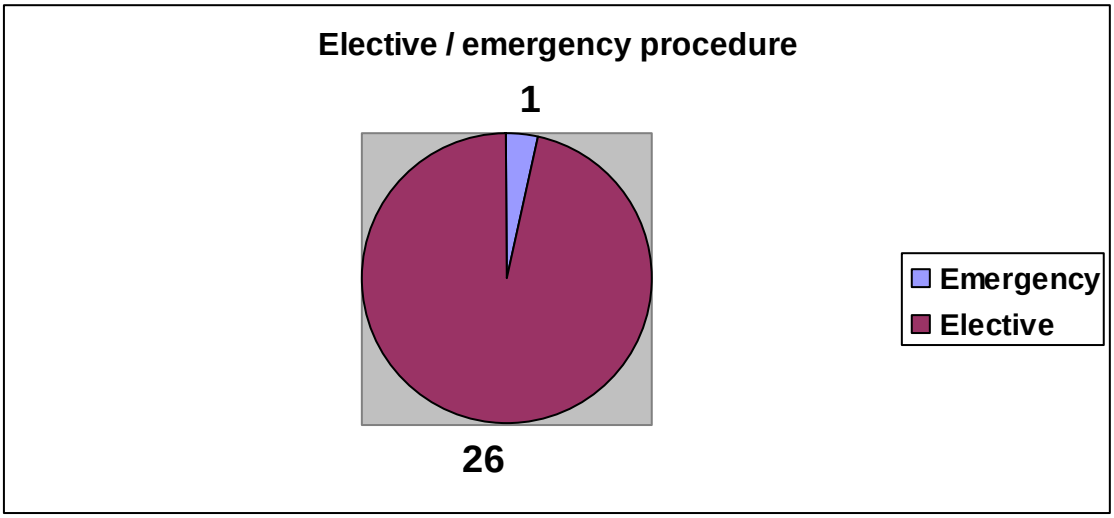


The characteristic features of macrocysts and rim calcifications were seen only in one patient. Cystic neoplasms were mistakenly diagnosed as pseudocysts in 4 out of 23 patients (17%). Accurate sub-typing of the cystic neoplasms was possible only in 5 out of 23 patients (21%). Splenic vein thrombosis was an incidental finding in 3 patients. Two patients were wrongly diagnosed to have duodenal GIST (gastro intestinal stromal tumor) on imaging.

Endoscopy

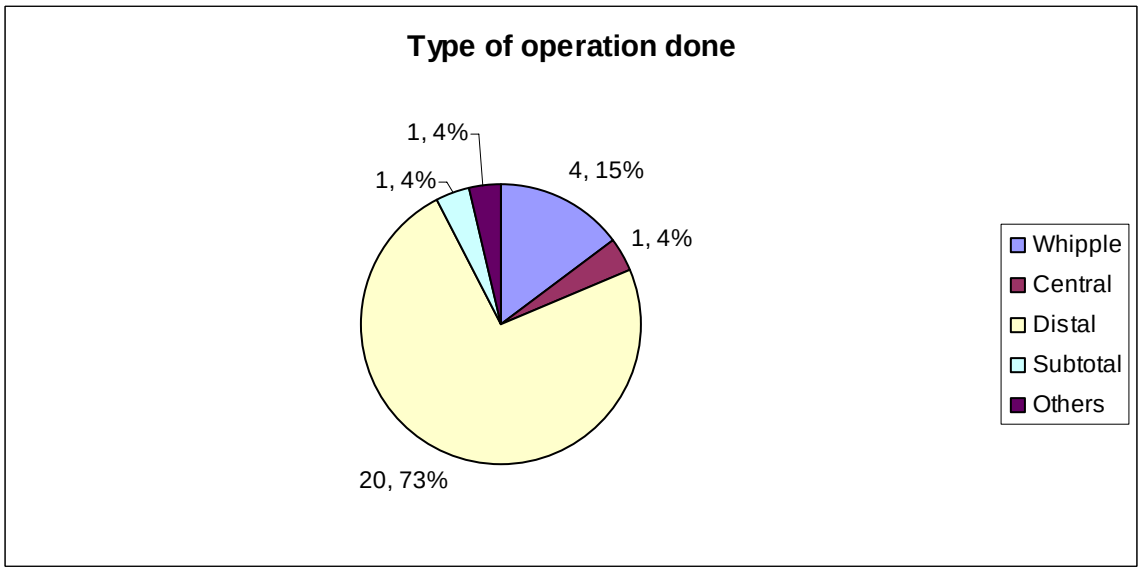
Only 4 patients underwent upper gastrointestinal scopy as a part of evaluation; these were normal. The patient with IPMN had side viewing scopy which showed a gaping major papilla with mucin. EUS was done in 3 patients, and a correct diagnosis was made in 1 patient. Cyst fluid was aspirated for analysis in only 1 patient, showing scanty atypical cells.

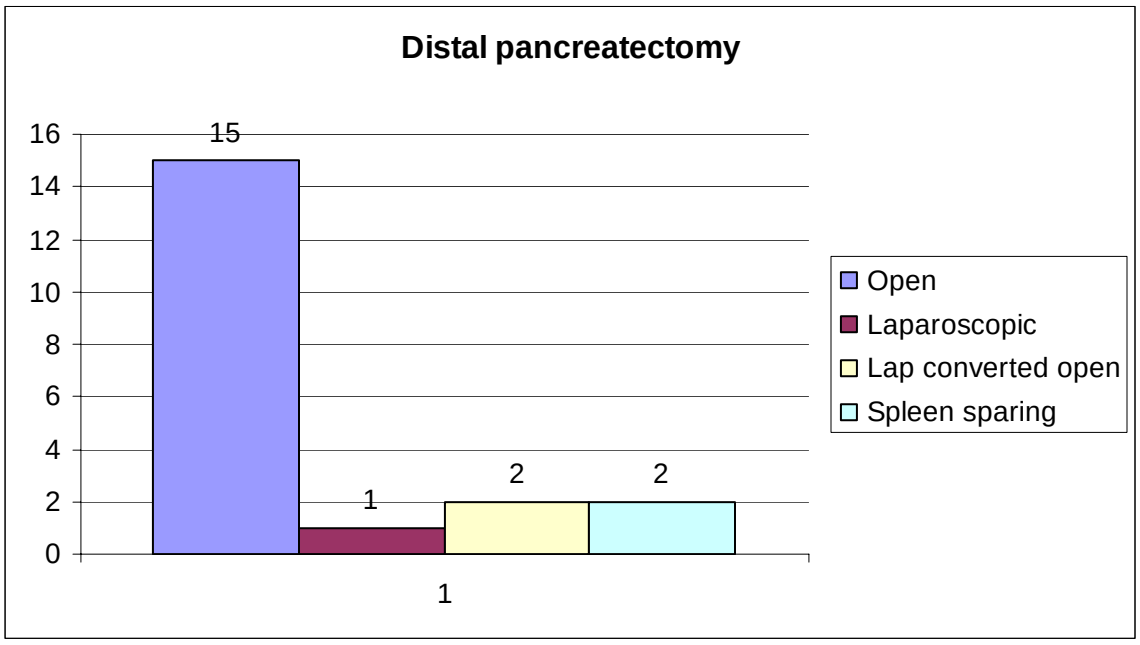
Operation Only one out of the twenty seven patients underwent an emergency procedure for ruptured cyst.



Type of operation

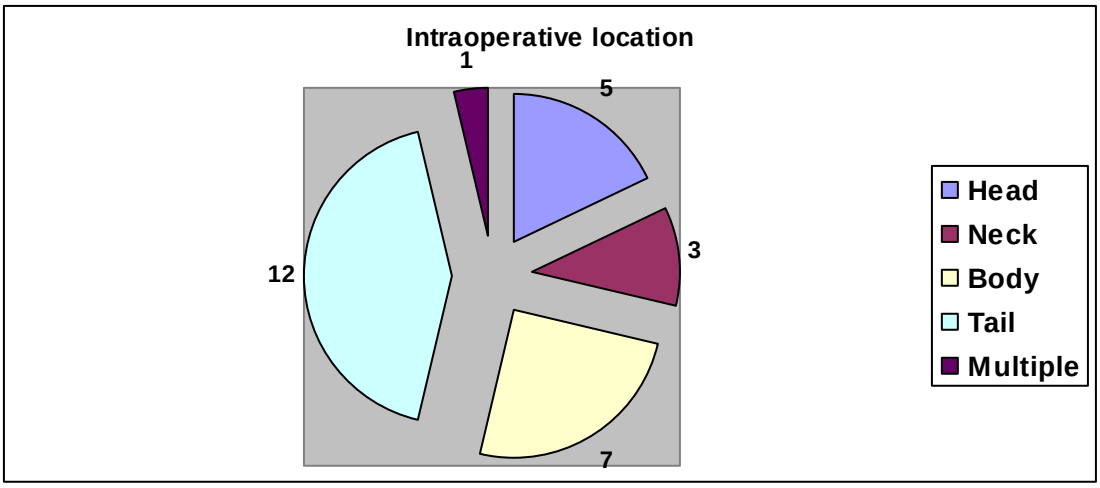
The operation done for these tumors depended on the location. The majority of patients underwent distal pancreatectomy (80%). The patient who had subtotal pancreatectomy required portal vein reconstruction (infiltration by tumor).



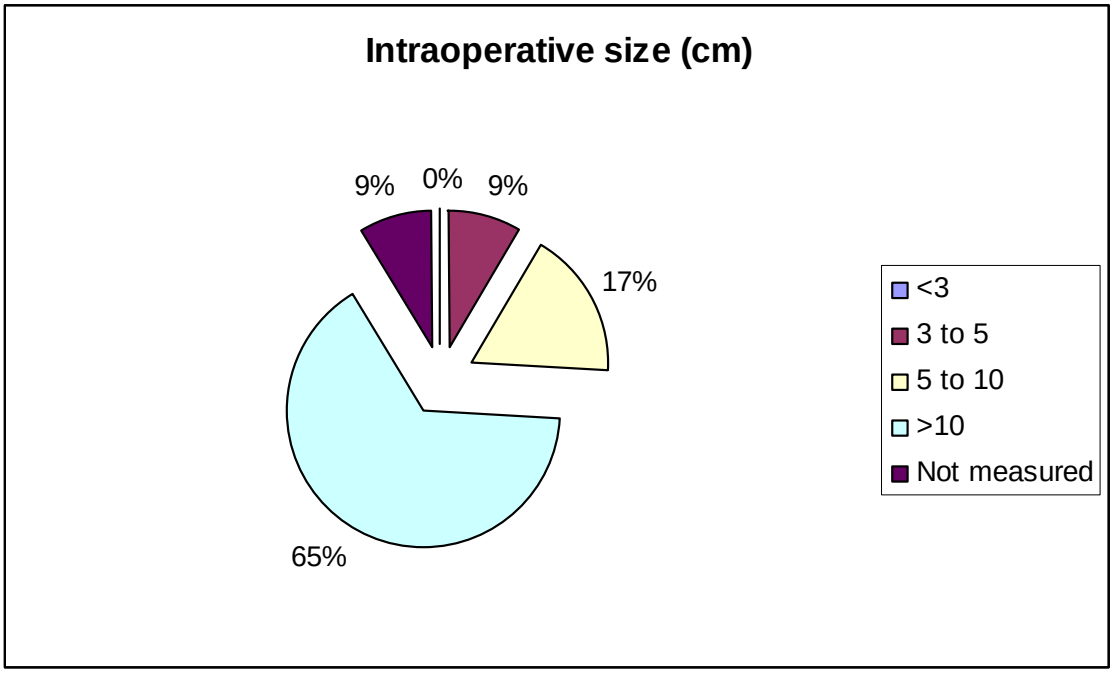


Operative findings

The tumors were predominantly located in the tail of the pancreas.



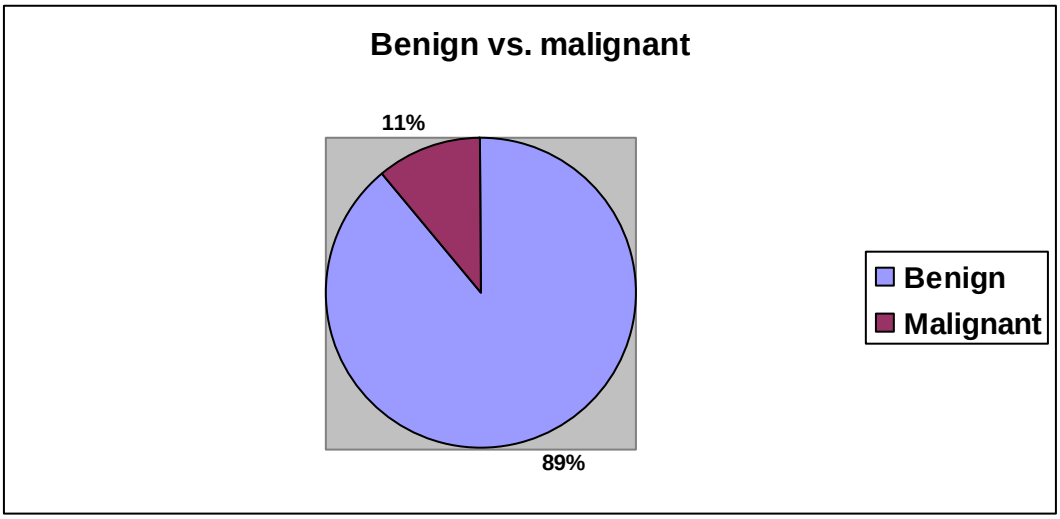
The size of the tumor was measured at the time of the operation. Sixty five percent of tumors were more than 10 cm in size. There were no tumors less than 3 cm in size.



There was no evidence of metastases in any of the patients; none of the tumors were inoperable.

Histopathology

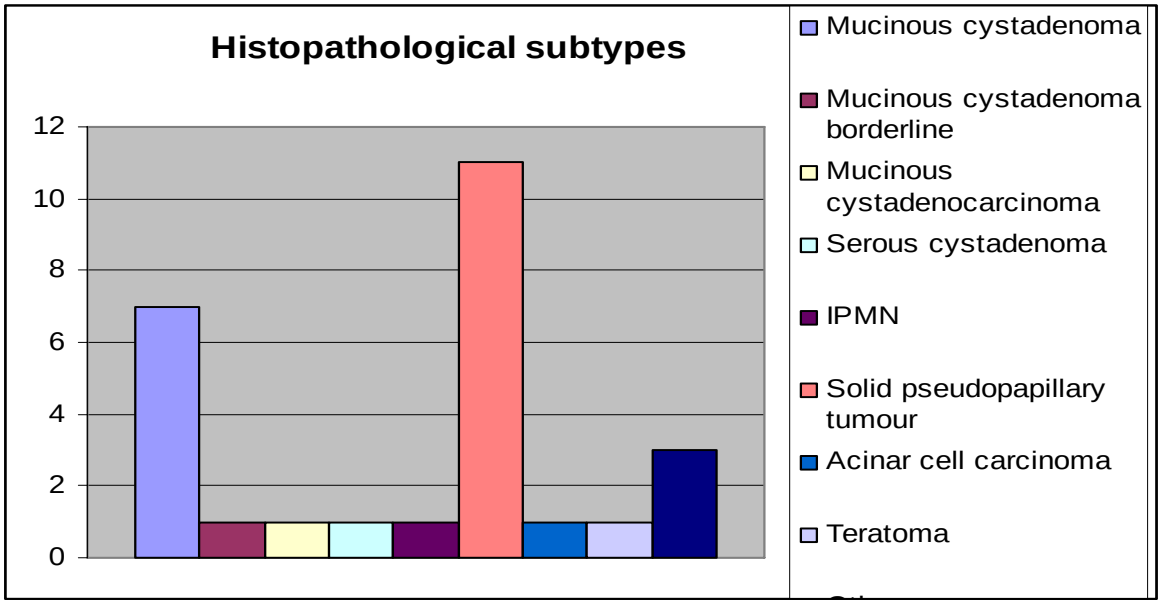
There were 3 malignant neoplasms in the series, accounting for 11% of patients.



On microscopic examination, the predominant subtype was solid pseudopapillary tumor.

Subtype	**N**
Mucinous cystadenoma	7
Mucinous cystadenoma borderline	1
Mucinous cystadenocarcinoma	1
Serous cystadenoma	1
IPMN	1
Solid pseudopapillary tumor	11

Acinar cell carcinoma	1
Teratoma	1
Others	3



The margins were involved microscopically in only one case of serous cystadenoma.

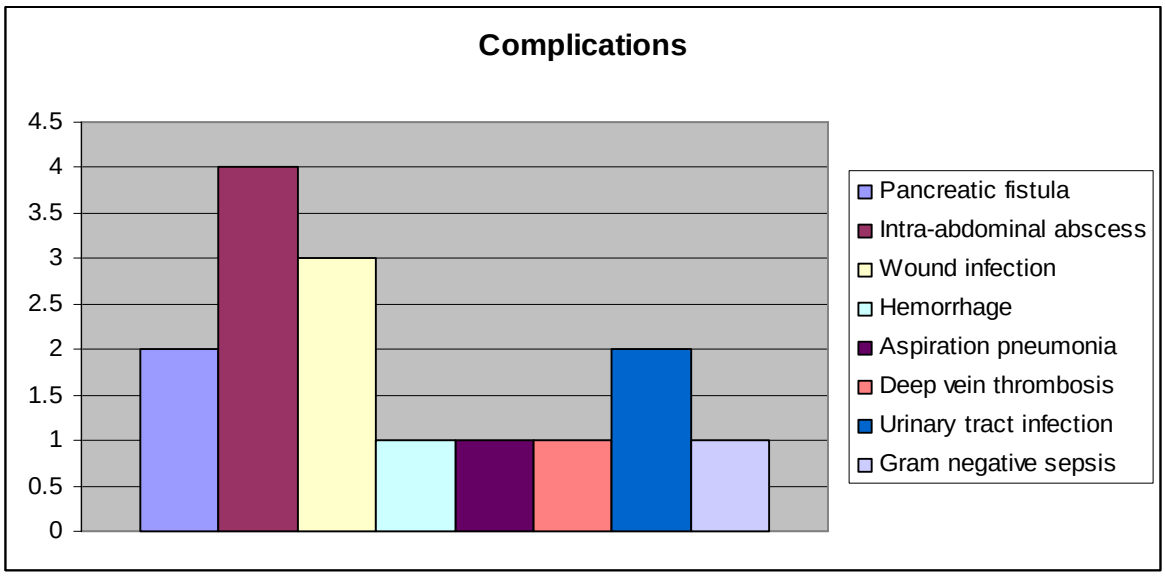
Complications

Intra-operative

One patient had an iatrogenic diaphragmatic rent intra-operatively, which was managed with closure and intercostal chest drainage.

Post-operative

Complication	N (%)
Pancreatic fistula	2 (7.5)
Intra-abdominal abscess	4 (15)
Wound infection	3 (11)
Hemorrhage	1 (3.7)
Aspiration pneumonia	1 (3.7)
Deep vein thrombosis	1 (3.7)
Urinary tract infection	2 (7.5)
Gram negative sepsis	1 (3.7)



There was no mortality.

Follow up

Follow up was available in 21 patients. The mean duration of follow up was 12.1 months. (Range: 0.5 to 43 months). One patient with mucinous cystadenoma had suspected recurrence at 13 months, and underwent re-excision.

Discussion

There is only one other similar case series from India dealing with cystic neoplasms of the pancreas, published in 1992. This review has the largest number of cases reported in India.

The patients were predominantly female, as expected. Unlike most other series, 40% of patients had solid pseudopapillary tumors, which are usually rare. Most other series report serous or mucinous cystadenomas as the commonest subtypes [1]. As these tumors are found in the 2nd and 3rd decades of life, the average age of the patients in our series was also less than expected.

With the increasing use of diagnostic abdominal imaging, we would have expected a larger proportion of these lesions to be picked up incidentally. Current evidence indicates that 40-75% of these tumors are detected as an incidental finding on radiographic images [10]. This trend was not found in our series, with only 2 patients diagnosed on routine imaging. The most common abdominal symptoms were abdominal pain and abdominal lump; in accordance with most case series in Western literature [35]. Half the patients did not have a palpable abdominal lump at presentation.

Routine hemogram and liver function tests did not contribute significantly towards a diagnosis. Serum amylase and lipase in all patients were not markedly

elevated, making a diagnosis of pseudocyst unlikely. Tumor markers were not helpful in differentiating among the various subtypes.

As most of our patients are referred from another centre, ultrasound imaging was not performed routinely. CT scan was accurate in diagnosing a neoplasm in 83% of cases, but sub-typing was possible in only 21% of patients. This may be due to the unfamiliarity of the junior radiologists with pathognomonic signs and recent terminology associated with cystic neoplasms of the pancreas. Only 10% of tumors were less than 3 cm in size, hence amenable for a trial of non-operative management. Most tumors <3 cm are detected incidentally. Hence with the increasing use of abdominal imaging, the proportion of cystic neoplasms for which conservative management is an option will increase in future [30].

The use of endoscopy and endoscopic ultrasound has only recently been added to the diagnostic armamentarium with regards to these cystic tumors. Only 3 patients underwent EUS in this series, but these were the more recent cases. EUS is a useful and necessary mode of investigation and will see more widespread use in future. All the recent reviews advocate the routine use of EUS in the management algorithm for indeterminate cystic lesions of the pancreas [36]. EUS along with cyst fluid analysis for amylase, CEA and viscosity is able to differentiate the various subtypes of cytic neoplasms [14].

All patients in our series were those selected for operative management. As the majority of lesions were located in the tail of the pancreas, distal pancreatectomy was the most frequent operation performed. Intra-abdominal collection and wound infection were the most common post-operative complications. Sheehan et al. [35] in their large series found pancreatic fistula to be their commonest complication, followed by wound infection.

There was no perioperative mortality. As mentioned earlier, one patient had suspicion of recurrence of mucinous cystadenoma on radiological imaging, but the operative specimen showed no features of recurrence on microscopy.

Limitations of the study

1. The nomenclature and terminology associated with these tumors as per the WHO classification was not strictly followed during reporting of radiological imaging and histopathological specimens.

2. Follow up was not available in 6 patients.

3. As most of our patients are referred from other centers, the diagnosis of a cystic neoplasm is already made when the patient visited this hospital.

4. The use of EUS and EUS guided FNAC as a routine diagnostic modality has only recently become available in this institution.

Conclusions

1. Cystic neoplasms of pancreas are relatively rare tumors, predominantly seen in the female population in the 4^{th} to 5^{th} decades of life.

2. Clinical presentation is non-specific and CT scan abdomen is the imaging modality of choice to diagnose these lesions.

3. Given the relatively late presentation of our subset of patients, non-operative management is usually not an option.

4. The extent of resection depends on the histological subtype of the lesions, but recurrence is rare and the prognosis is uniformly good.

Bibliography

1. Salvia, R., et al., *Pancreatic cystic tumors.* Minerva Chir, 2004. 59(2): p. 185-207.
2. Warshaw, A.L. and P.L. Rutledge, *Cystic tumors mistaken for pancreatic pseudocysts.* Ann Surg, 1987. 205(4): p. 393-8.
3. Adsay, V., *Cystic lesions of the pancreas.* Modern Pathology, 2007. 20: p. S71-S93.
4. Hamilton SR, A.L., *World Health Organization classification of tumours. Tumours of the digestive system.* 2000: p. 234-240.
5. Gasslander, T., et al., *Cystic tumors of the pancreas.* Dig Dis, 2001. 19(1): p. 57-62.
6. Spinelli, K.S., et al., *Cystic pancreatic neoplasms: observe or operate.* Ann Surg, 2004. 239(5): p. 651-7; discussion 657-9.
7. Sarr, M.G., et al., *Cystic neoplasms of the pancreas: benign to malignant epithelial neoplasms.* Surg Clin North Am, 2001. 81(3): p. 497-509.
8. Brugge, W.R., et al., *Cystic neoplasms of the pancreas.* N Engl J Med, 2004. 351(12): p. 1218-26.
9. Sakorafas, G.H. and M.G. Sarr, *Cystic neoplasms of the pancreas; what a clinician should know.* Cancer Treat Rev, 2005. 31(7): p. 507-35.
10. Sarr, M.G., et al., *Primary cystic neoplasms of the pancreas. Neoplastic disorders of emerging importance-current state-of-the-art and unanswered questions.* J Gastrointest Surg, 2003. 7(3): p. 417-28.

11. Grieshop, N.A., et al., *Cystic neoplasms of the pancreas.* Am Surg, 1994. 60(7): p. 509-14; discussion 514-5.

12. Lim, S.J., et al., *Preoperative evaluation of pancreatic cystic lesions: cost-benefit analysis and proposed management algorithm.* Surgery, 2005. 138(4): p. 672-9; discussion 679-80.

13. Kiely, J.M., et al., *Cystic pancreatic neoplasms: enucleate or resect?* J Gastrointest Surg, 2003. 7(7): p. 890-7.

14. Barreto, G., et al., *Cystic tumours of the pancreas.* HPB (Oxford), 2007. 9(4): p. 259-66.

15. Yamaguchi, K., et al., *Mucin-hypersecreting tumors of the pancreas: assessing the grade of malignancy preoperatively.* Am J Surg, 1996. 171(4): p. 427-31.

16. Yamaguchi, T., et al., *Huge pseudocyst of the pancreas caused by poorly differentiated invasive ductal adenocarcinoma with osteoclast-like giant cells: report of a case.* Hepatogastroenterology, 2007. 54(74): p. 599-601.

17. Oehler, U., et al., *Osteoclast-like giant cell tumour of the pancreas presenting as a pseudocyst-like lesion.* Virchows Arch, 1997. 431(3): p. 215-8.

18. Myung, S.J., et al., *Adenosquamous carcinoma of the pancreas: differentiation from pancreatic pseudocyst.* Gastrointest Endosc, 1998. 47(5): p. 410-3.

19. Siriwadena, A., *Contemporary management of pseudocysts.* Pancreatology, 2005. 5: p. 507–509.

20. Aljarabah, M. and B.J. Ammori, *Laparoscopic and endoscopic approaches for drainage of pancreatic pseudocysts: a systematic review of published series.* Surg Endosc, 2007. 21(11): p. 1936-44.

21. Khalifeh I, Q.F., Jacques S, et al. , *The nature of'ovarian-like' mesenchyme of pancreatic and hepatic mucinous cystic neoplasms: A recapitulation of the periductal fetal mesenchme? .* Modern Pathol 2004. 4.

22. Adsay, N., *Cystic lesions of the pancreas.* Modern Pathology, 2007. 20: p. S71-S93.

23. Friedman, A.C., J.E. Lichtenstein, and A.H. Dachman, *Cystic neoplasms of the pancreas. Radiological-pathological correlation.* Radiology, 1983. 149(1): p. 45-50.

24. Taouli, B., et al., *Intraductal papillary mucinous tumors of the pancreas: helical CT with histopathologic correlation.* Radiology, 2000. 217(3): p. 757-64.

25. Mohan, H., et al., *Solid and cystic papillary epithelial neoplasm of the pancreas.* J Postgrad Med, 2006. 52(2): p. 141-2.

26. Kehagias, D., et al., *Cystic tumors of the pancreas: preoperative imaging, diagnosis, and treatment.* Int Surg, 2002. 87(3): p. 171-4.

27. Sperti, C., et al., *Value of 18-fluorodeoxyglucose positron emission tomography in the management of patients with cystic tumors of the pancreas.* Ann Surg, 2001. 234(5): p. 675-80.

28. Tanaka, M., et al., *International consensus guidelines for management of intraductal papillary mucinous neoplasms and mucinous cystic neoplasms of the pancreas.* Pancreatology, 2006. 6(1-2): p. 17-32.

29. Sahani, D.V., et al., *Pancreatic cysts 3 cm or smaller: how aggressive should treatment be?* Radiology, 2006. 238(3): p. 912-9.

30. Allen, P.J., et al., *A selective approach to the resection of cystic lesions of the pancreas: results from 539 consecutive patients.* Ann Surg, 2006. 244(4): p. 572-82.

31. Tseng, J.F., et al., *Serous cystadenoma of the pancreas: tumor growth rates and recommendations for treatment.* Ann Surg, 2005. 242(3): p. 413-9; discussion 419-21.

32. Sarr, M.G., et al., *Clinical and pathologic correlation of 84 mucinous cystic neoplasms of the pancreas: can one reliably differentiate benign from malignant (or premalignant) neoplasms?* Ann Surg, 2000. 231(2): p. 205-12.

33. Maire, F., et al., *Prognosis of malignant intraductal papillary mucinous tumours of the pancreas after surgical resection. Comparison with pancreatic ductal adenocarcinoma.* Gut, 2002. 51(5): p. 717-22.

34. Chari, S.T., et al., *Study of recurrence after surgical resection of intraductal papillary mucinous neoplasm of the pancreas.* Gastroenterology, 2002. 123(5): p. 1500-7.

35. Sheehan, M.K., et al., *Spectrum of cystic neoplasms of the pancreas and their surgical management.* Arch Surg, 2003. 138(6): p. 657-60; discussion 660-2.

36. Garcea, G., et al., *Cystic lesions of the pancreas. A diagnostic and management dilemma.* Pancreatology, 2008. 8(3): p. 236-51.

Cystic neoplasms of the pancreas - proforma

Serial No.
Name
Age
Gender
Hospital Number
Diagnosis
Presenting complaints Duration

- Asymptomatic
- Abdominal lump
- Pain
- Jaundice
- Nausea
- Vomiting
- Constipation
- Diarrhea
- Abdominal distension
- Fatigue
- Early satiety
- Pancreatic exocrine insufficiency
- Previous history of pancreatitis

Examination findings

- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations

- Hb
- Serum creatinine
- Glucose AC
  PC
- Serum amylase
- Serum lipase
- LFT
- Tumor markers
  - CA 19-9
  - CEA
  - CA-125

- USG
  - Presentation

- Location
- Cyst
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

- CT
  - Presentation
  - Cyst size
  - Location
  - Macrocystic
  - Rim calcification
  - Neoplasm x pseudocyst
  - Serous x mucinous
  - Benign x malignant
  - Radiologist's opinion

- Endoscopy
  - Ampulla
  - Extrinsic mass
- ERCP
  - Communication with the cyst cavity

- EUS
  - Adjacent mass
  - Macrocystic septation
  - Honeycomb septation

- EUS guided FNAC

- Tumor markers in cyst fluid
  - CEA
  - CA 19-9
  - CA-125
  - Amylase

- Operation done

- Operative findings
  - Location
  - Size
  - Benign / malignant

- Inoperable

Histopathology
- Type
- Benign/malignant
- Margin
- Spleen
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation
- Gram negative sepsis

Death

Follow up
- Duration
- Recurrence

Cystic neoplasms of the pancreas

Serial No. 1
Name Sk. Melon
Age 20
Gender M
Hospital Number 132409D
Diagnosis Retention cyst

Presenting complaints	Duration
Asymptomatic	discharging sinus left flank 4 y following I and D
Pain	
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 12.4
- Serum creatinine 1.0
- Glucose AC 75
  PC 102

Serum amylase 244
Serum lipase 76
LFT 0.5/0.2/9.1/3.7/30/53/304
Tumor markers
- CA 19-9
- CEA
- CA-125

USG
- Presentation
- Location
- Cyst
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

CT
- Presentation
- Cyst size multiple 6 cm
- Location head and tail
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant
- Radiologist’s opinion sequelae of acute pancreatitis

Endoscopy
- Ampulla
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA
- CA 19-9
- CA-125
- Amylase

Operation done Sinusogram proceed laparotomy and drainage of peripancreatic abscesses

Operative findings
- Location Head and tail
- Size
- Benign / malignant
- Inoperable

Histopathology
- Type Distended duct/retention cyst
  - Keratinous debris
- Benign/malignant
- Margin
- Spleen
- Immune staining

Post-operative complications
- Pancreatic fistula present
- Intra-abdominal abscess present
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration Nil

Recurrence

Cystic neoplasms of the pancreas

Serial No. 2
Name Monowara Begum
Age 27
Gender F
Hospital Number 275688D
Diagnosis Solid pseudopapillary tumor

Presenting complaints	Duration
Asymptomatic	
Pain upper abdominal	4 y
Jaundice	
Nausea	
Vomiting present	4 y
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations

- Hb 11.2
- Serum creatinine 1.0
- Glucose AC 110
  PC
- Serum amylase
- Serum lipase
- LFT
- Tumor markers
  - CA 19-9
  - CEA
  - CA-125

- USG
  - Presentation
  - Location
  - Cyst
  - Microcyst
  - Macrocyst
  - Dilated pancreatic duct
  - Solid component
  - Papillary

- CT
  - Presentation mass tail of pancreas
  - Cyst size
  - Location
  - Marcocystic
  - Rim calcification
  - Neoplasm x pseudocyst
  - Serous x mucinous
  - Benign x malignant
  - Radiologist’s opinion

- Endoscopy
  - Ampulla

Extrinsic mass

ERCP

Communication with the cyst cavity

EUS

Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid

CEA
CA 19-9
CA-125
Amylase

Operation done Laparoscopic converted open distal pancreatectomy and splenectomy

Operative findings

Location Tail
Size 10 x 8 cm solid tumor
Benign / malignant benign
Inoperable

Histopathology

Type Solid pseudopapillary tumor
Benign/malignant Benign
Margin Free
Spleen Congestion
Immune staining

Post-operative complications

Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis

Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 15 d
Recurrence no

Cystic neoplasms of the pancreas

Serial No. 5
Name Antara Ghosh
Age 26
Gender F
Hospital Number 264608D
Diagnosis Solid papillary epithelial neoplasm

Presenting complaints	Duration
Asymptomatic	
Pain	
Lump upper abdomen	3 m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	

Previous history of pancreatitis

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm 10 x 10 cm smooth

Investigations
- Hb 13.3
- Serum creatinine 1.0
- Glucose AC
  PC
- Serum amylase
- Serum lipase
- LFT 0.6/0.2/8.4/4.6/16/18/111
- Tumor markers
  - CA 19-9 5.73
  - CEA 0.469
  - CA-125

- USG
  - Presentation
  - Location
  - Cyst
  - Microcyst
  - Macrocyst
  - Dilated pancreatic duct
  - Solid component
  - Papillary

- CT
  - Presentation
  - Cyst size

Location near head
Marcocystic
Rim calcification
Neoplasm x pseudocyst neoplasm
Serous x mucinous
Benign x malignant
Radiologist's opinion GIST

Endoscopy
Ampulla normal
Extrinsic mass

ERCP
Communication with the cyst cavity

EUS
Adjacent mass- large mass with well defined margins anterior wall D2, hypoechoic, Separate from duodenum and pancreas.
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done Whipple procedure

Operative findings
Location Head
Size 12 x 10 cm
Benign / malignant benign
Inoperable

Histopathology
Type Solid papillary epithelial neoplasm
Benign/malignant Benign
Margin Free
Spleen

Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess present
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis present
- Delayed gastric emptying
- Urinary tract infection yes
- Reoperation

Death

Follow up
- Duration 4m
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 6
Name Gitanjali Dutta
Age 43
Gender F
Hospital Number 225911D
Diagnosis Mucinous cystic neoplasm

Presenting complaints	Duration
Asymptomatic	
Pain	
Lump	1 yr
Jaundice	
Nausea	1 yr

Vomiting
Jaundice
Constipation
Diarrhea
Abdominal distension
Fatigue
Early satiety
Pancreatic exocrine insufficiency
Previous history of pancreatitis

Examination findings
Mass
<2 cm
2-3 cm
3-5 cm
5-10 cm 7 x 7 cm LUQ Smooth
>10 cm

Investigations
Hb 10.1
Serum creatinine 0.9
Glucose AC 92
PC 82
Serum amylase
Serum lipase 239
LFT0.9/0.2/8.3/4.2/19/10/92
Tumor markers
CA 19-9 48.6
CEA 3.36
CA-125

USG
Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT

Presentation
Cyst size 10 x 8.5 x 7 cm
Location Body and tail
Marcocystic
Rim calcification
Neoplasm x pseudocyst not sure
Serous x mucinous
Benign x malignant
Radiologist's opinion neoplasm less likely
Splenic vein thrombosed

Endoscopy

Ampulla
Extrinsic mass

ERCP

Communication with the cyst cavity

EUS

Adjacent mass - large cyst in relation to body and tail with debris
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid

CEA 231
CA 19-9 >1000
CA-125
Amylase 9938

Operation done Distal pancreatectomy, splenectomy and cholecystectomy

Operative findings

Location Tail
Size 12 x 10
Benign / malignant benign
Inoperable

Histopathology
- Type Mucinous cystic neoplasm
- Benign/malignant benign
- Margin
- Spleen congestion
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration 14 days
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 7
Name Dipa Saha
Age 24
Gender F
Hospital Number 126507D
Diagnosis Solid cystic papillary neoplasm

Presenting complaints — Duration

- Asymptomatic — yes
- Pain
- Jaundice
- Nausea
- Vomiting
- Jaundice
- Constipation
- Diarrhea
- Abdominal distension
- Fatigue
- Early satiety
- Pancreatic exocrine insufficiency
- Previous history of pancreatitis

Examination findings

- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm 10 x 10 cm

Investigations

- Hb 6.7
- Serum creatinine 0.7
- Glucose AC 87
  PC 114
- Serum amylase
- Serum lipase
- LFT 0.5/0.2/9.0/4.4/45/34/95
- Tumor markers
  - CA 19-9 7.2
  - CEA
  - CA-125

- USG
  - Presentation Yes
  - Location
  - Cyst

Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT
Presentation
Cyst size Heterogenously enhancing 10 x 10.5 cm
Location body
Marcocystic
Rim calcification present
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant
Radiologist's opinion SPEN / neuroendocrine tumor

Endoscopy
Ampulla
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done Distal pancreatectomy and splenectomy

Operative findings
Location body

Size 20 x 15 cm
Benign / malignant benign
Inoperable

Histopathology
Type Solid papillary epithelial neoplasm
Benign/malignant benign
Margin free
Spleen congestion
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage
Aspiration pneumonia left lower lobe
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration Nil
Recurrence

Cystic neoplasms of the pancreas

Serial No. 8
Name Sussy Thomas
Age 40

Gender F
Hospital Number 415071C
Diagnosis Mucinous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain low back	2 yrs
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 10.3
- Serum creatinine 0.7
- Glucose AC
  PC 100
- Serum amylase 128
- Serum lipase
- LFT 0.6/0.2/7.6/4.3/29/21/68
- Tumor markers
  - CA 19-9 <2.50
  - CEA
  - CA-125

- USG

Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT
Presentation
Cyst size
Location
Marcocystic
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant
Radiologist's opinion

Endoscopy
Ampulla
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase
Operation done Distal pancreatectomy and splenectomy

Operative findings
- Location body and tail
- Size 6 x 5 cm
- Benign / malignant benign
- Inoperable

Histopathology
- Type mucinous cystadenoma
- Benign/malignant benign
- Margin
- Spleen congestion
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration 3years
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 9
Name Arpita Kundu
Age 21
Gender F
Hospital Number 724621c
Diagnosis Solid papillary epithelial neoplasm

Presenting complaints	Duration
Asymptomatic	
Pain Upper abdominal	3 m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm 11 x 9 cm epigastric

Investigations
- Hb 10.4
- Serum creatinine 0.8
- Glucose AC
  PC
- Serum amylase 105
- Serum lipase 57
- LFT
- Tumor markers
  - CA 19-9 <2.5
  - CEA

CA-125

USG
- Presentation
- Location ?
- Cyst 12.5 x 10 x 9 cm
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component predominantly solid with few cystic areas
- Papillary

CT
- Presentation
- Cyst size 13 x 12 x 7 cm
- Location body and tail
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant
- Radiologist's opinion leiomyoma/GIST
- Splenic vein thrombosis

Endoscopy
- Ampulla
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA

CA 19-9
CA-125
Amylase

Operation done Distal pancreatectomy and splenectomy

Operative findings
- Location body
- Size 15 x 10 cm
- Benign / malignant
- Inoperable

Histopathology
- Type Solid pseudopapillary neoplasm
- Benign/malignant benign
- Margin
- Spleen congestion
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration 23 m
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 10
Name Paramita Sen Gupta Mittal
Age32
Gender F
Hospital Number 827789C
Diagnosis Boderliine mucinous cystic neoplasm

Presenting complaints	Duration
Asymptomatic	
Pain Left flank	1 year
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 10.5
- Serum creatinine 1.0
- Glucose AC 96

PC

Serum amylase
Serum lipase
LFT 0.5/0.2/7.6/3.5/23/35/138
Tumor markers
CA 19-9
    CEA
    CA-125

USG
    Presentation
    Location body and tail
    Cyst 2.6 x 2.6 cm
    Microcyst
    Macrocyst
    Dilated pancreatic duct
    Solid component
    Papillary

CT
    Presentation
    Cyst size 32 x 31 mm
    Location body
    Marcocystic
    Rim calcification
    Neoplasm x pseudocyst
    Serous x mucinous
    Benign x malignant
    Radiologist’s opinion

Endoscopy
    Ampulla
    Extrinsic mass
ERCP
    Communication with the cyst cavity

EUS
    Adjacent mass
    Macrocystic septation
    Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA
- CA 19-9
- CA-125
- Amylase

Operation done Laparoscopic converted open distal pancreatectomy

Operative findings
- Location body
- Size 3 x 3 cm
- Benign / malignant
- Inoperable

Histopathology
- Type borderline mucinous cystic neoplasm
- Benign/malignant borderline
- Margin free
- Spleen congestion
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection Superficial wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up

Duration 1 year

Recurrence no

Cystic neoplasms of the pancreas

Serial No. 11
Name Anjali Sema
Age 41
Gender F
Hospital Number 960853C
Diagnosis Mucinous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain RUQ	1 yr
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations

- Hb 8.4
- Serum creatinine 0.7
- Glucose AC 99
  PC 105
- Serum amylase
- Serum lipase
- LFT 0.4/0.1/8.3/4.2/13/10/98
- Tumor markers
  - CA 19-9 <2.50
  - CEA
  - CA-125

- USG
  - Presentation
  - Location
  - Cyst
  - Microcyst
  - Macrocyst
  - Dilated pancreatic duct
  - Solid component
  - Papillary

- CT
  - Presentation
  - Cyst size
  - Location
  - Marcocystic
  - Rim calcification
  - Neoplasm x pseudocyst
  - Serous x mucinous
  - Benign x malignant
  - Radiologist’s opinion

- Endoscopy
  - Ampulla
  - Extrinsic mass
- ERCP

Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done Spleen preserving distal pancreatectomy

Operative findings
Location body
Size not mentioned
Benign / malignant
Inoperable

Histopathology
Type Benign mucinous cystadenoma
Benign/malignant benign
Margin
Spleen
Immune staining

Post-operative complications
Pancreatic fistula present
Intra-abdominal abscess
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
- Duration 19 m
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 12
Name Sahana Begum
Age 39
Gender F
Hospital Number 592998C
Diagnosis Solid papillary epithelial neoplasm

Presenting complaints	Duration
Asymptomatic	
Pain	3-4 y
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm

3-5 cm
5-10 cm
>10 cm

Investigations

Hb 12.7
Serum creatinine 0.9
Glucose AC 120
PC 164
Serum amylase
Serum lipase
LFT0.5/0.2/8.0/4.5/32/34/105
Tumor markers
CA 19-9
CEA
CA-125

USG

Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT

Presentation
Cyst size 8.5 x 7.5 x 5.8 cm
Location Tail
Marcocystic solid and cystic
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant
Radiologist's opinion solid cystic papillary neoplasm

Endoscopy

Ampulla
Extrinsic mass

ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done Laparoscopic distal pancreatectomy and splenectomy

Operative findings
Location tail
Size 10 cm
Benign / malignant
Inoperable

Histopathology
Type Solid papillary epithelial neoplasm
Benign/malignant benign
Margin
Spleen congestion
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess- lesser sac collection and left peural effusion
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis

Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 43 m
Recurrence no

Cystic neoplasms of the pancreas

Serial No. 13
Name Mita Hore
Age 44
Gender F
Hospital Number 812828C
Diagnosis Mucinous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain epigastric	4 -5 y
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency Steatorrhea	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm
- Splenomegaly

Investigations
- Hb 10.1
- Serum creatinine 0.8
- Glucose AC
  PC
- Serum amylase 452
- Serum lipase 143
- LFT 1.0/0.2/7.6/4.4/24/11/57
- Tumor markers
  - CA 19-9 15.4
  - CEA
  - CA-125

- USG
  - Presentation
  - Location
  - Cyst
  - Microcyst
  - Macrocyst
  - Dilated pancreatic duct
  - Solid component
  - Papillary

- CT
  - Presentation
  - Cyst size 3.3 x 2.6 cm
  - Location body
  - Marcocystic
  - Rim calcification
  - Neoplasm x pseudocyst
  - Serous x mucinous

Benign x malignant
Radiologist's opinion mucinous cystadenoma/carcinoma / pseudocyst

Endoscopy
Ampulla normal
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done spleen sparing distal pancreatectomy

Operative findings
Location body
Size 4 x 4 cm
Benign / malignant
Inoperable

Histopathology
Type Mucinous cystadenoma
Benign/malignant benign
Margin
Spleen
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess

Wound infection
Hemorrhage present
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 27 m
Recurrence after 13 m completion distal pancreatectomy. No tumor in specimen

Cystic neoplasms of the pancreas

Serial No. 14
Name Soma Roy
Age 26
Gender F
Hospital Number 546857C
Diagnosis Mucinous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain luq	2 y
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	

Fatigue
Early satiety
Pancreatic exocrine insufficiency
Previous history of pancreatitis

Examination findings
Mass
<2 cm
2-3 cm
3-5 cm
5-10 cm
>10 cm

Investigations
Hb14.0
Serum creatinine 0.7
Glucose AC 100
PC
Serum amylase 118
Serum lipase 76
LFT 0.8/0.2/8.0/4.2/34/59/147
Tumor markers
CA 19-9
CEA
CA-125

USG
Presentation suboptimal
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT
Presentation

Cyst size 5.4 x 2.8 cm
Location tail
Marcocystic
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant infiltration present
Radiologist's opinion cystic neoplasm

Endoscopy
Ampulla normal
Extrinsic mass

ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase 73400

Operation done Distal pancreatectomy and splenectomy

Operative findings
Location 6 x 5 cm body and tail
Size
Benign / malignant
Inoperable

Histopathology
Type Mucinous cystadenoma
Benign/malignant benign
Margin
Spleen congestion

Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection Superficial
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration 3m
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 15
Name Rumi Sarkar
Age 34
Gender F
Hospital Number 900362C
Diagnosis Solid pseudopapillary neoplasm

Presenting complaints	Duration
Asymptomatic	
Pain upper abdomen discomfort	6 m
Jaundice	
Nausea	
Vomiting	

Jaundice
Constipation
Diarrhea
Abdominal distension
Fatigue
Early satiety
Pancreatic exocrine insufficiency
Previous history of pancreatitis

Examination findings
Mass
<2 cm
2-3 cm
3-5 cm
5-10 cm 7 x 5 cm
>10 cm

Investigations
Hb 12.6
Serum creatinine 0.8
Glucose AC 112
PC 132
Serum amylase
Serum lipase
LFT
Tumor markers
CA 19-9
CEA
CA-125

USG
Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT
- Presentation
- Cyst size 12 x 8 cm
- Location tail
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant
- Radiologist's opinion

Endoscopy
- Ampulla
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA
- CA 19-9
- CA-125
- Amylase

Operation done Distal pancreatectomy

Operative findings
- Location tail
- Size 15 x 15 cm
- Benign / malignant
- Inoperable

Histopathology
- Type Solid Pseudopapillary epithelial neoplasm

Benign/malignant benign
Margin Free
Spleen Congestion
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration nil
Recurrence

Cystic neoplasms of the pancreas

Serial No. 16
Name Sima Biswas
Age 25
Gender F
Hospital Number 897471C
Diagnosis solid pseudopapillary tumor

Presenting complaints	Duration
Asymptomatic	
Pain luq	3m

Jaundice
Nausea
Vomiting
Jaundice
Constipation
Diarrhea
Abdominal distension prev laparotomy and panc fistula
Fatigue
Early satiety
Pancreatic exocrine insufficiency
Previous history of pancreatitis

Examination findings
Mass
<2 cm
2-3 cm
3-5 cm
5-10 cm
>10 cm

Investigations
Hb 8.1
Serum creatinine 1.9
Glucose AC
PC
Serum amylase 208
Serum lipase 319
LFT 0.4/0.2/6.7/3.1/23/12/108
Tumor markers
CA 19-9
CEA
CA-125

USG
Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct

Solid component
Papillary

CT
Presentation
Cyst size 11 x 8.6 x 6.4 cm
Location body and tail
Marcocystic
Rim calcification
Neoplasm x pseudocyst stranding , splenic vein thrombosis
Serous x mucinous
Benign x malignant
Radiologist's opinion infected pseudocyst

Endoscopy
Ampulla
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done Distal pancreatectomy ans splenectomy

Operative findings
Location 5 x 5 cm
Size distal body and tail

Benign / malignant diaphragmatic rent
Inoperable

Histopathology
Type Solid cystic pseudopapillary neoplasm
Benign/malignant benign
Margin free
Spleen Normal
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess percutaneous drain placed
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 2m
Recurrence no

Cystic neoplasms of the pancreas ip

Serial No. 17
Name Rebecca George

Age 62
Gender F
Hospital Number 304532B
Diagnosis Mucinous cystadenoma

Presenting complaints	Duration
Asymptomatic	incidental pickup
Pain	
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 12.2
- Serum creatinine 0.9
- Glucose AC128
  PC 190
- Serum amylase
- Serum lipase
- LFT
- Tumor markers
  - CA 19-9
  - CEA
  - CA-125

USG

- Presentation yes
- Location tail, pseudocyst
- Cyst 6 x 5 cm
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

CT

- Presentation
- Cyst size 6 x 4 cm
- Location tail , no solid component, MPD not dilated
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant benign
- Radiologist’s opinion serous cystadenoma

Endoscopy

- Ampulla
- Extrinsic mass

ERCP

- Communication with the cyst cavity

EUS

- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid

- CEA
- CA 19-9
- CA-125
- Amylase

Operation done Distal pancreatectomy splenectomy

Operative findings
- Location body and tail
- Size
- Benign / malignant
- Inoperable

Histopathology
- Type Mucinous cystadenoma
- Benign/malignant
- Margin
- Spleen
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration nil
- Recurrence

Cystic neoplasms of the pancreas

Serial No. 18
Name Savita Singh
Age 36
Gender F
Hospital Number 036672 D
Diagnosis Mucinous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain	5 years
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 12.1
- Serum creatinine 0.6
- Glucose AC
  PC
- Serum amylase
- Serum lipase
- LFT
- Tumor markers
  - CA 19-9 53.1

CEA 1.85
CA-125

USG
- Presentation
- Location
- Cyst
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

CT
- Presentation
- Cyst size 9.5 x 8.5 cm
- Location distal body and tail
- Marcocystic unilocular
- Rim calcification
- Neoplasm x pseudocyst pseudocyst
- Serous x mucinous
- Benign x malignant
- Radiologist's opinion pseudocyst

Endoscopy
- Ampulla
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA

CA 19-9
CA-125
Amylase

Operation done Distal pancreatectomy and splenectomy

Operative findings
- Location mass body of pancreas
- Size 10 x 8 cm
- Benign / malignant
- Inoperable

Histopathology
- Type Benign mucinous cystadenoma
- Benign/malignant benign
- Margin Free
- Spleen Normal
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection present
- Reoperation

Death

Follow up
- Duration 15 d
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 19
Name Sipra Das
Age 53
Gender F
Hospital Number 274084D
Diagnosis IPMN

Presenting complaints	Duration
Asymptomatic	
Pain	8 m
Jaundice	3 w
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency steatorrhea	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm tender ruq mass
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 10.2
- Serum creatinine 0.7
- Glucose AC 111
  PC 202
- Serum amylase 128

Serum lipase
LFT 0.5/0.2/7.8/3.9/73/38/468
Tumor markers
- CA 19-9 307
- CEA
- CA-125

USG
- Presentation
- Location
- Cyst
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

CT
- Presentation
- Cyst size4 x 4 x 4 cm
- Location uncinate obstruction of MPD and CBD
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant loss of fat plane
- Radiologist’s opinion malignant neoplasm

Endoscopy
- Ampulla gaping major papilla plugged with mucus
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass- MPD dilated in head, body and tail , mural nodules seen
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC scanty atypical cells

Tumor markers in cyst fluid
- CEA
- CA 19-9
- CA-125
- Amylase

Operation done Whipple procedure

Operative findings
- Location head to tail ductal dilatation
- Size excised till free frozen margin
- Benign / malignant
- Inoperable

Histopathology
- Type IPMN with moderate dysplasia
- Benign/malignant benign
- Margin
- Spleen
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection superficial
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration 15 d
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 20
Name Saritha
Age963338C
Gender F
Hospital Number 963338C
Diagnosis Solid pseudo papillary neoplasm

Presenting complaints	Duration
Asymptomatic lump	2 y
Pain dull dragging	2 y
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm 15 x 20 cm lump

Investigations
- Hb 10.3

Serum creatinine 0.7
Glucose AC 102
PC
Serum amylase
Serum lipase
LFT
Tumor markers
- CA 19-9 13.4
- CEA
- CA-125

USG
- Presentation
- Location
- Cyst
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

CT
- Presentation
- Cyst size
- Location body and tail
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant
- Radiologist's opinion c Loop GIST

Endoscopy
- Ampulla -Normal
- Extrinsic mass

ERCP

Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done whipple

Operative findings
Location head
Size 15 x 12 cm
Benign / malignant
Inoperable

Histopathology
Type solid pseudopapillary neoplasm
Benign/malignant benign
Margin free
Spleen
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
- Duration 6 m
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 30
Name Angurbala Mandal
Age 53
Gender F
Hospital Number 273358 C
Diagnosis Serous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain epigastric burning	4 m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm

3-5 cm
5-10 cm
>10 cm 10 x 10 cm epigastric mass

Investigations

Hb 9.3
Serum creatinine 0.7
Glucose AC
PC 83
Serum amylase 90
Serum lipase
LFT0.8/0.2/8.7/4.6/21/14/138
Tumor markers
CA 19-9 3.89
CEA
CA-125

USG

Presentation
Location tail
Cyst 6.7 x 5.8 x 4.4 cm
Microcyst
Macrocyst present
Dilated pancreatic duct
Solid component
Papillary

CT

Presentation
Cyst size 6 x 6 x 7 cm
Location body and tail
Marcocystic solid component, calcification
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous mucinous
Benign x malignant

Radiologist’s opinion mucinous cystic neoplasm

Endoscopy
Ampulla normal
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done distal pancreatectomy and splenectomy

Operative findings
Location body and tail
Size 10 x 6 cm
Benign /
Inoperable

Histopathology
Type Solid papillary epithelial neoplasm
Benign/malignant benign
Margin
Spleen normal
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage

Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying Ileus
Urinary tract infection
Reoperation

Death

Follow up
Duration 13 m
Recurrence no

Cystic neoplasms of the pancreas ip

Serial No. 22
Name Rathinammal
Age 48
Gender F
Hospital Number 789293C
Diagnosis Mucinous cystadenocarcinoma

Presenting complaints	Duration
Asymptomatic	
Pain	6m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	

Previous history of pancreatitis Emergency presentation

Examination findings

Mass free fluid rupture

<2 cm

2-3 cm

3-5 cm

5-10 cm

>10 cm

Investigations

Hb 14.9

Serum creatinine 1.2

Glucose AC 294

PC

Serum amylase 497

Serum lipase 526

LFT

Tumor markers

CA 19-9 6.26

CEA 0.80

CA-125

USG

Presentation

Location tail

Cyst 12 x 6 cm thick wall

Microcyst

Macrocyst

Dilated pancreatic duct

Solid component

Papillary

CT

Presentation

Cyst size 12 x 11 x 11 cm

Location tail enhancing septation
Marcocystic
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant
Radiologist's opinion complicated pseudocyst

Endoscopy
Ampulla
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase 3350

Operation done distal pancreatectomy, splenectomy

Operative findings
Location tail
Size 10 x 9 cm
Benign / malignant
Inoperable adherent to tr mesocolon

Histopathology
Type Mucinous cystadenocarcinoma
Benign/malignant malignant
Margin free
Spleen normal
Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection burst
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation burst
- Enterocutaneous fistula, stroke

Death

Follow up
- Duration nil
- Recurrence

Cystic neoplasms of the pancreas

Serial No. 23
Name Urmimala Mukherjee
Age 54
Gender F
Hospital Number 165335D
Diagnosis Acinar cell carcinoma

Presenting complaints	Duration
Asymptomatic	
Pain	
Jaundice	
Nausea	
Vomiting	1 yr

Jaundice
Constipation
Diarrhea
Abdominal distension
Fatigue
Early satiety
Pancreatic exocrine insufficiency
Previous history of pancreatitis

Examination findings
Mass
<2 cm
2-3 cm
3-5 cm
5-10 cm 8 x 7 cm epigastric
>10 cm

Investigations
Hb 10.3
Serum creatinine 0.7
Glucose AC82
PC 99
Serum amylase238
Serum lipase
LFT 0.5/0.3/6.5/2.8/25/18/152
Tumor markers
CA 19-9 30.0
CEA 8.5
CA-125

USG
Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT
- Presentation
- Cyst size 8x12x12 cm
- Location body and tail
- Marcocystic
- Rim calcification vascular
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant benign
- Radiologist's opinion islet cell tumor solid pseudo papillary tumor

Endoscopy
- Ampulla normal
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA
- CA 19-9
- CA-125
- Amylase

Operation done distal pancreatecomy and splenectomy

Operative findings
- Location body and tail
- Size 15 x 12 cm
- Benign / malignant benign

Inoperable

Histopathology
- Type Acinar cell carcinoma
- Benign/malignant malignant
- Margin free
- Spleen congestion
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration nil
- Recurrence

Cystic neoplasms of the pancreas

Serial No. 24
Name Nirmal Kumar Sinha
Age 43

Gender M
Hospital Number 083790D
Diagnosis Mucin producing adenocarcinoma

Presenting complaints	Duration
Asymptomatic	
Pain luq	5m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	Loss of weight
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 14.2
- Serum creatinine 0.9
- Glucose AC 108
  PC 168
- Serum amylase 92
- Serum lipase 30
- LFT 0.4/0.2/7.9/4.7/22/29/82
- Tumor markers
  - CA 19-9
  - CEA
  - CA-125

- USG

Presentation
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT

Presentation
Cyst size solid and cystic areas
Location body and tail
Marcocystic
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant
Radiologist's opinion no opinion

Endoscopy

Ampulla
Extrinsic mass

ERCP

Communication with the cyst cavity

EUS

Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid

CEA
CA 19-9
CA-125
Amylase

Operation done distal pancreatectomy splenectomy

Operative findings
- Location body and tail
- Size
- Benign / malignant
- Inoperable

Histopathology
- Type Mucin producing adenocarcinoma
- Benign/malignant malignant
- Margin free
- Spleen congestion
- Nodal mets present

- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation

Death

Follow up
- Duration 10 m
- Recurrence no

Cystic neoplasms of the pancreas ip

Serial No. 25
NameTumpa Barua
Age 18
Gender F
Hospital Number 172706D
Diagnosis Benign cystic lesion

Presenting complaints	Duration
Asymptomatic Right adnexal mass	
Pain	2m
Jaundice	
Nausea	
Vomiting	2m
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm palpable 26 weeks
  - >10 cm

Investigations12
- Hb 13.4
- Serum creatinine 0.5
- Glucose AC
  PC
- Serum amylase
- Serum lipase
- LFT
- Tumor markers

- CA 19-9
- CEA
- CA-125 50.8

USG
- Presentation
- Location
- Cyst
- Microcyst
- Macrocyst
- Dilated pancreatic duct
- Solid component
- Papillary

CT
- Presentation
- Cyst size
- Location
- Marcocystic
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous
- Benign x malignant
- Radiologist’s opinion

Endoscopy
- Ampulla
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass
- Macrocystic septation
- Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
- CEA
- CA 19-9
- CA-125
- Amylase

Operation done mesopancreatectomy

Operative findings
- Location 20 x 15 cm
- Size neck
- Benign / malignant
- Inoperable

Histopathology
- Type benign cystic lesion
- Benign/malignant benign
- Margin
- Spleen
- Immune staining

Post-operative complications
- Pancreatic fistula
- Intra-abdominal abscess
- Wound infection
- Hemorrhage
- Aspiration pneumonia
- Deep vein thrombosis
- Delayed gastric emptying
- Urinary tract infection
- Reoperation
- Gram neg sepsis ++

Death

Follow up
- Duration 15 days
- Recurrence no

Cystic neoplasms of the pancreas

Serial No. 30
Name Angurbala Mandal
Age 53
Gender F
Hospital Number 273358 C
Diagnosis serous cystadenoma

Presenting complaints	Duration
Asymptomatic	
Pain epigastric burning	4y
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm

Investigations
- Hb 12.9
- Serum creatinine 0.7
- Glucose AC
  PC 114
- Serum amylase 193

Serum lipase
LFT 0.6/0.2/7.7/4.1/28/37/79
Tumor markers
- CA 19-9 4.5
- CEA
- CA-125

USG
- Presentation
- Location tail
- Cyst 6 x 6 x 4 cm
- Microcyst
- Macrocyst multiseptated cystic with solid components
- Dilated pancreatic duct
- Solid component
- Papillary

CT
- Presentation
- Cyst size 6 x 6 x 7 cmcm
- Location body and tail
- Marcocystic solid compnonent, calcification
- Rim calcification
- Neoplasm x pseudocyst
- Serous x mucinous mucinous
- Benign x malignant
- Radiologist’s opinion mucinous cystic neoplasm

Endoscopy
- Ampulla
- Extrinsic mass

ERCP
- Communication with the cyst cavity

EUS
- Adjacent mass

Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done distal pancreatectomy and splenectomy

Operative findings
Location body and tail
Size 10 x 6 cm
Benign /
Inoperable

Histopathology
Type Serous cystadenoma
Benign/malignant benign
Margin
Spleen normal
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage ileus
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration

Recurrence

Cystic neoplasms of the pancreas

Serial No.32
Name Maya Maity
Age 28
Gender F
Hospital Number 977822c
Diagnosis teratoma

Presenting complaints	Duration
Asymptomatic	
Pain upper	5 yrs
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
- Mass
  - <2 cm
  - 2-3 cm
  - 3-5 cm
  - 5-10 cm
  - >10 cm 10 x 10 cm epigastric

Spleen 2 cm

Investigations

Hb 10

Serum creatinine

Glucose AC PC

Serum amylase 70

Serum lipase

LFT

Tumor markers

CA 19-9 <2.50

CEA 61.2

CA-125

USG

Presentation

Location

Cyst

Microcyst

Macrocyst

Dilated pancreatic duct

Solid component

Papillary

CT

Presentation

Cyst size 21 x 16 x 11 cm

Location tail lesser sac splenic vein thrombosis

Marcocystic

Rim calcification

Neoplasm x pseudocyst

Serous x mucinous

Benign x malignant

Radiologist's opinion dermoid

Endoscopy

Ampulla

Extrinsic mass

ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done distal panacreatectomy splenectomy

Operative findings
Location body and tail
Size 17 x 15 cm
Benign / malignant
Inoperable

Histopathology
Type mature cystic teratoma
Benign/malignant benign
Margin
Spleen
Immune staining

Post-operative complications
Pancreatic fistula
Intra-abdominal abscess
Wound infection
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 11 months
Recurrence no

Cystic neoplasms of the pancreas

Serial No.33
Name Baby A.
Age 17
Gender F
Hospital Number 327356 C
DiagnosisSPT

Presenting complaints	Duration
Asymptomatic	
Pain upper and lump	3m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	
Diarrhea	
Abdominal distension	
Fatigue diagnosed hydatid cyst, underwent lap bx	
Early satiety	
Pancreatic exocrine insufficiency	
Previous history of pancreatitis	

Examination findings
Mass
<2 cm

2-3 cm
3-5 cm 4 x4 cm
5-10 cm
>10 cm

Investigations

Hb 12
Serum creatinine
Glucose AC PC
Serum amylase
Serum lipase
LFT 0.4/0.2/7.6/4.6/25/13/112
Tumor markers
CA 19-9
CEA
CA-125

USG

Presentation hydatid cyst liver
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT

Presentation
Cyst size
Location
Marcocystic
Rim calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant

Radiologist's opinion
Endoscopy
Ampulla
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase
Operation done PPPD

Operative findings
Location Head
Size 10 x 10 cm
Benign / malignant
Inoperable

Histopathology
Type Solid cystic neoplasm
Benign/malignant
Margin
Spleen
Immune staining

Post-operative complications
Pancreatic fist

al abscess
Wound infection
Hemorrhage

Aspiration pneumonia
Deep vein thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 25 m
Recurrence no

Cystic neoplasms of the pancreas

Serial No. 29
Name Sofia Hima Bindu
Age 34
Gender F
Hospital Number 917093C
Diagnosis Solid pseudopapillary tumor

Presenting complaints	Duration
Asymptomatic	
Pain upper	6m
Jaundice	
Nausea	
Vomiting	
Jaundice	
Constipation	

Diarrhea
Abdominal distension
Fatigue
Early satiety
Pancreatic exocrine insufficiency
Previous history of pancreatitis

Examination findings
Mass
<2 cm
2-3 cm
3-5 cm
5-10 cm
>10 cm

Investigations
Hb 10.1
Serum creatinine 0.7
Glucose AC
PC
Serum amylase 96
Serum lipase
LFT
Tumor markers
CA 19-9 8.71
CEA
CA-125

USG
Presentation
Location
Cyst
Microcyst
Macrocyst
Dilated pancreatic duct
Solid component
Papillary

CT

Presentation
Cyst size 5 x 5 x 2.8 cm
Location body
Marcocystic
Rim calcification chunky calcification
Neoplasm x pseudocyst
Serous x mucinous
Benign x malignant malignant
Radiologist's opinion malignant

Endoscopy
Ampulla
Extrinsic mass
ERCP
Communication with the cyst cavity

EUS
Adjacent mass
Macrocystic septation
Honeycomb septation

EUS guided FNAC

Tumor markers in cyst fluid
CEA
CA 19-9
CA-125
Amylase

Operation done Subtotal pancreatectomy and splenectomy

Operative findings
Location neck
Size 5 x 4 cm
Benign / malignant
Inoperable

Histopathology
Type solid pseudopapillary neoplasm
Benign/malignant benign
Margin free

Spleen congestion
Immune staining

Post-operative complications
Pancreatic fistula present
Intra-abdominal abscess
Wound infection present
Hemorrhage
Aspiration pneumonia
Deep vein thrombosis smv thrombosis
Delayed gastric emptying
Urinary tract infection
Reoperation

Death

Follow up
Duration 11m
Recurrence no